COAL AGE

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National Coal Association Meeting

WITH more than two years of accomplishment behind it, the National Coal Association has just held its third annual convention. We publish in this issue the report of the retiring president, Mr. H. N. Taylor, a record that everyone should read to realize the extent of the activities of the association. The National Association is shown to have played a very important part in shaping the destinies of the coal industry in the past year, for through this organization the government and the public as represented at Washington has been kept informed of the condition of the industry.

The testimony given by members of the association before the Senate committee investigating the high price of coal was such as to give the coal man a clean bill of health last year. The work of the section on railroad relations did much to keep up a spirit of active co-operation with the carriers, with attendant good results. The value of proper cost accounting has been preached and the use of the standard forms adopted by the association has been extended to cover many fields.

That the association is gaining in strength is shown by the fact that despite the resignation of several large producers because of the stand of the majority on the questions of assigned and privately-owned cars, the proportion of total production of the country represented in the membership of the national organization has increased in the last year.

Throughout the meeting there was an undoubted feeling that now, if ever, is the time for the coal men to stand together in a united organization. Good-natured contests over the elections of officers only serve to indicate the whole-hearted interest of the members and do not show a lack of solidarity. President Taylor's call for co-operation as a means to success and the evident desire of the members for even better teamwork than in the past in solving the problems facing the industry are plain evidence that the National Coal Association has a good year ahead.

Daniel B. Wentz

WITH a multitude of able men from whom to make a selection, the directors of the National Coal Association wisely chose D. B. Wentz, of Philadelphia, as president for the coming year. Not so widely and intimately known in the industry as his predecessors in this office, to his friends and associates, who regard Col. Wentz as a lovable and pleasing personality and as a coal producer and business executive of wide experience and broad ideas, his election is extremely fortunate for the association.

We recall him first as a national figure with the Committee on Coal Production in 1917, when he was one of the few appointees to that work who gave their whole time to the tasks and who really gave constructive help to the chairman, Mr. Peabody, in the days when the trial of the coal industry began. Cool, patient and courageous, his invariable courtesy never fails to win for him his point. His record with the American Expeditionary Force has never been told. It is sufficient to say that in the face of apparently insurmountable difficulties and official red tape he gave our forces coal as Atterbury gave them transportation.

He brings to the leadership of the coal industry an international as well as a national viewpoint. As an operator in union and non-union coal fields in the South, East and West he will appreciate the problems of all sections and from his wide experience will lead where others will be willing to follow. We congratulate the National Coal Association on its choice of Colonel Wentz for president.

Cheap Transportation with Cheap Coal

TRANSPORTATION cheaper than in any other country in the world is what the railroads of the United States are giving us, A. H. Smith, president of the New York Central R.R., told the coal operators at Atlantic City last week. The answer came from the audience that the railroads are getting their coal cheaper than in any other country in the world.

Coal operators are opposing assigned cars for fuel coal because the roads use the cars to pay in part for the coal; that is, they thereby lower the price of railroad fuel coal. Now, that might not in itself be a bad thing but for the fact that necessarily and inevitably the cost of producing coal at mines not accepting assigned cars is materially increased, and because these are the mines that supply the general public the price of coal for all users other than the railroads is raised. The public is required to pay more for coal in order that the railroads can pay less.

The people of the United States are willing to pay value received for what they get and we are sure that did they but understand this situation fully they would tell the roads to pay for coal what it is worth and put it on the transportation bill. The railroads can pay the same for coal as others and still give this country cheaper transportation than in any other country, because even then they will be getting cheap coal.

A Fit Place to Live

HOUSES for labor are a part of the plant of most coal mines. These houses should be homes, but one reading the description of company housing in the bituminous coal fields printed in *Coal Age* of May 20 will understand why they are seldom homes and why mine labor is prone to shift. In the past anything that kept out the rain and weather was good enough for a company house. Rows of frame shacks of a monotonous sameness, depressing to the eye, were the habitations offered mine labor and still are the only houses available in many camps today.

For years the rents charged for these houses have not changed from about $2 per room per month, but that is all they have been worth. Such dwellings rouse none of the home building instincts that lie in the breasts of all normal men. Under such conditions a man is more likely to keep on the move—to shift from one place to another—than to settle down.

This thought is not new—it has been preached for years. The new thought is that as new housing is built it shall conform to modern ideas of what constitute American homes. Despite the high cost of materials and labor, some very large bituminous coal mines are now being developed and houses planned and built. The answer to the extra cost of building the right kind of houses is that you can capitalize that extra cost in better-satisfied labor and more efficient, steady men.

Vindication of the Railroads

MINING interests have conflicting sentiments regarding the railroads. Indubitably, coal operators have suffered much from the abuses incident to the practice of assigning cars and from the evils of railroad competition with private concerns. They have been annoyed and even robbed by the confiscation of coal—a confiscation that has not been marked by any consideration of the needs of either the operator or his clients. Nevertheless the coal operator still realizes that the necessities of the railroads have accounted for many of their exactions. Not being allowed to live, the railroads have not been advocates of a "Live and let live" principle.

However, the unpleasing relationship with railroad companies has not entirely blunted the mind of the mine executive to the injustice to which railroad management has been subjected by the unfair judgment of the public. He knows that only by allowing the railroads to make money can they be efficient. Few are there that do not know that during the war the German machinations did the country less harm than had already been done by the overdrastic regulation of the railroads by the Interstate Commerce Commission. We went to war with a wrecked railroad system and there was nothing that more sadly held up our war preparations. The railroads continued operating with difficulty, their attempts being bolstered by the patriotism that the war evoked. When the war ended and business revived it was found that the railroads could not fill the nation's needs.

Seeing then that the railroads suffered by restriction, it is gratifying to learn that the policing we gave them was unfair. It is disclosed now that we have not a true bill against them. They are not vastly overcapitalized, as was said; instead their physical property is worth immensely more than their stock would suggest and far and away more than their stock and bonds could be purchased for in the open market.

In the early days most of the railroads failed to make dividends. They were bought in for a fraction of their value by syndicates or by larger railroads which enjoyed a better traffic. There was no watering of stock at that time but rather a frying out of fat. Furthermore the work on the earlier roads was done with cheap labor. Only as far back as 1893 common railroad labor could be obtained for 80c. to $1 per day, and it was often rendered by men anxious to give service and ready to work ten or more hours a day. Naturally, with wages and hours what they are now or even what they were before the war the roads could not be duplicated at the price of construction.

Again many railroads steadily made improvements out of capital earned. Some paid no dividends, it is said, because they wished to freeze out small stockholders; others desired to put their roadbeds in better condition and spent their earnings on that work, though they might well have borrowed the money. Watered stock there undoubtedly was, but many of the companies were developing their properties and they were fast becoming far more valuable than their books showed. Appreciation of property and ploughed-in capital was making the railroads more valuable year by year.

Thus it happened that on May 27 the Interstate Commerce Commission was informed that the railroads were physically worth over two billions of dollars more than their capitalization and that their bonds and stocks could be purchased in the open market at present prices for six billions of dollars less than money that would provide for the replacement of the roads at the wage and land rates now ruling.

Figures were given for 51,853 miles of roads in all parts of the country, the valuation being based on the lower wage scale obtaining in 1914. They cover one-sixth of the total investment in American railroads. Yet the older and stronger Western properties are not included, nor are the Pennsylvania and New York Central railroads in the East. The reports as summarized run as follows:

Roads	Cost for reconstruction and land	Investment on carriers' books	Difference
18 Eastern	$1,205,407,829	$1,014,807,254	$190,600,575
14 Southern	366,288,043	335,647,336	30,640,707
18 Western	1,632,086,671	1,807,820,506	—175,733,835
50 Roads	$3,203,782,543	$3,158,275,096	$45,507,447

Railroads that have been continually beset by public aspersions nevertheless show up well on valuation. Thus the New York, New Haven & Hartford inventory proves to be worth $124,000,000 in excess of the company's statement of its investment, the Boston & Maine has an excess of $80,000,000; the Rock Island, of $47,000,000; the Great Northern, of $34,000,000, and the Big Four, of $15,000,000.

Inquiry into railroad values proves that they are conservatively estimated by their owners and that the railroad companies are well justified in demanding that they receive a fair profit on the basis of those valuations until the Interstate Commerce Commission completes its own estimate. If the dividends paid railroads are to be limited by law they should be based on the actual value of the property involved and they should not be less than can be earned by other safe investments. Even mortgages today bring more than 5½ per cent, which is the railroads' limit.

In the case of the railroads muckraking is doing its perfect work, so that today we cannot run our industrial plants for want of raw material and inability to reach markets. It is busy on the electric railway systems. Soon we shall walk to work if we cannot afford to buy an automobile and pay for gasoline, tires and garage charges. It is destroying our electric power companies and before long we shall be in darkness if the dark influences of the muckrakers are not controlled. When the railroads were first criticized we had too many railroads; now after two decades of condemnation our railroads are inadequate. No state is so strong that it can weather successfully the powers of persistent lying.

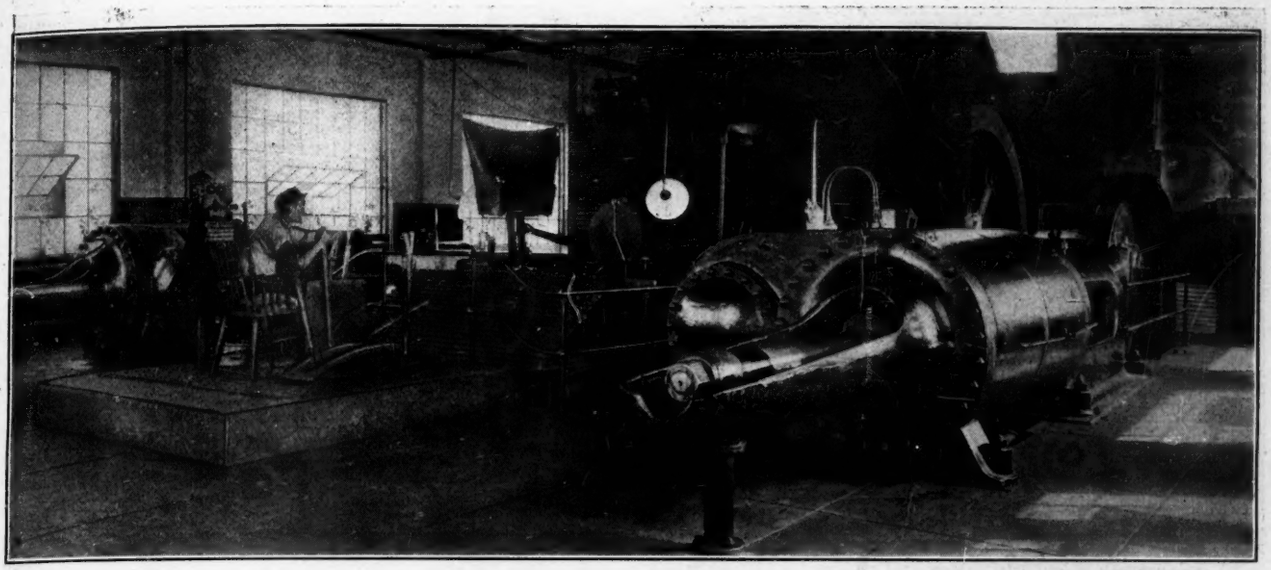

FIG. 1. HOIST ENGINE AT NO. 4 MINE AS IT APPEARS WHEN HOISTING BAILING BUCKETS
As may be seen, this is a heavy, substantial, high-duty machine such as is employed at many a mine plant for hoisting coal. This engine went wild when the buckets were overwound. It was repaired by the oxyacetylene torch.

Oxyacetylene Promptly Clears Shaft and Repairs Engine Bed After an Overwind

As the Result of an Overwind the Bedplate of the Hoisting Engine Was Broken and Its Foundation Bolts Were Sheared—Two Bailing Buckets, Several Hundred Feet of Rope and an 8-In. Pipe Were Wedged Together at the Bottom of the Shaft — Repairs Were Made by Means of the Oxyacetylene Torch

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IT IS indeed a coincidence that the two most important factors in and about a mine—men and machinery—should be rescued, when necessity arises, by one and the same agency—oxygen. In one case the oxygen respirator performs the work of resuscitation; in the other the means employed is the oxyacetylene flame, by the aid of which metals are cut and welded. This article will deal with the use of the oxyacetylene process in the repair and clearing away of the wreckage after a remarkable accident at a large anthracite mine.

About three years ago the hoisting engine of this company was badly wrecked. This engine, Fig. 1, was employed for bailing water, two 3,000-gal. tanks being used as the bailing buckets. Fig. 2 shows in the foreground the top of a similar tank with guide shoes on

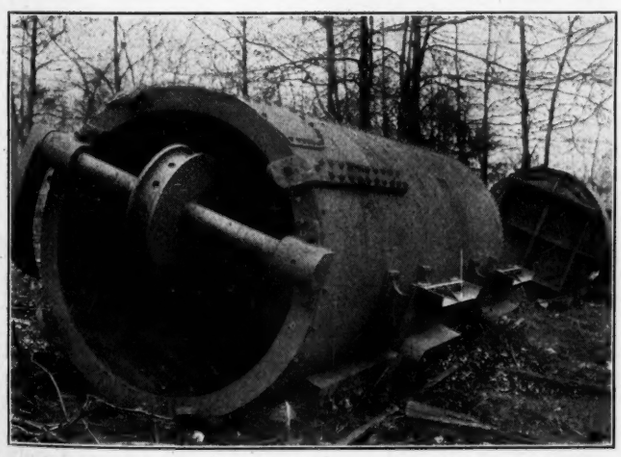

FIG. 2. PAIR OF BUCKETS FOR BAILING OUT SUMP
Each of these huge bailers is five feet in diameter and thirty feet long. It is discharged by the cam at the top acting on the valves in the bottom.

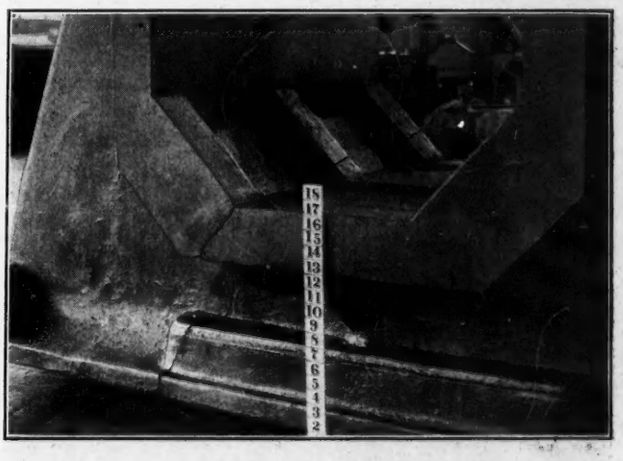

FIG. 3. BADLY FRACTURED BEARING PEDESTAL
The entire end of the engine frame has been cracked completely off by the violence of the racing engine. The gage is read in inches.

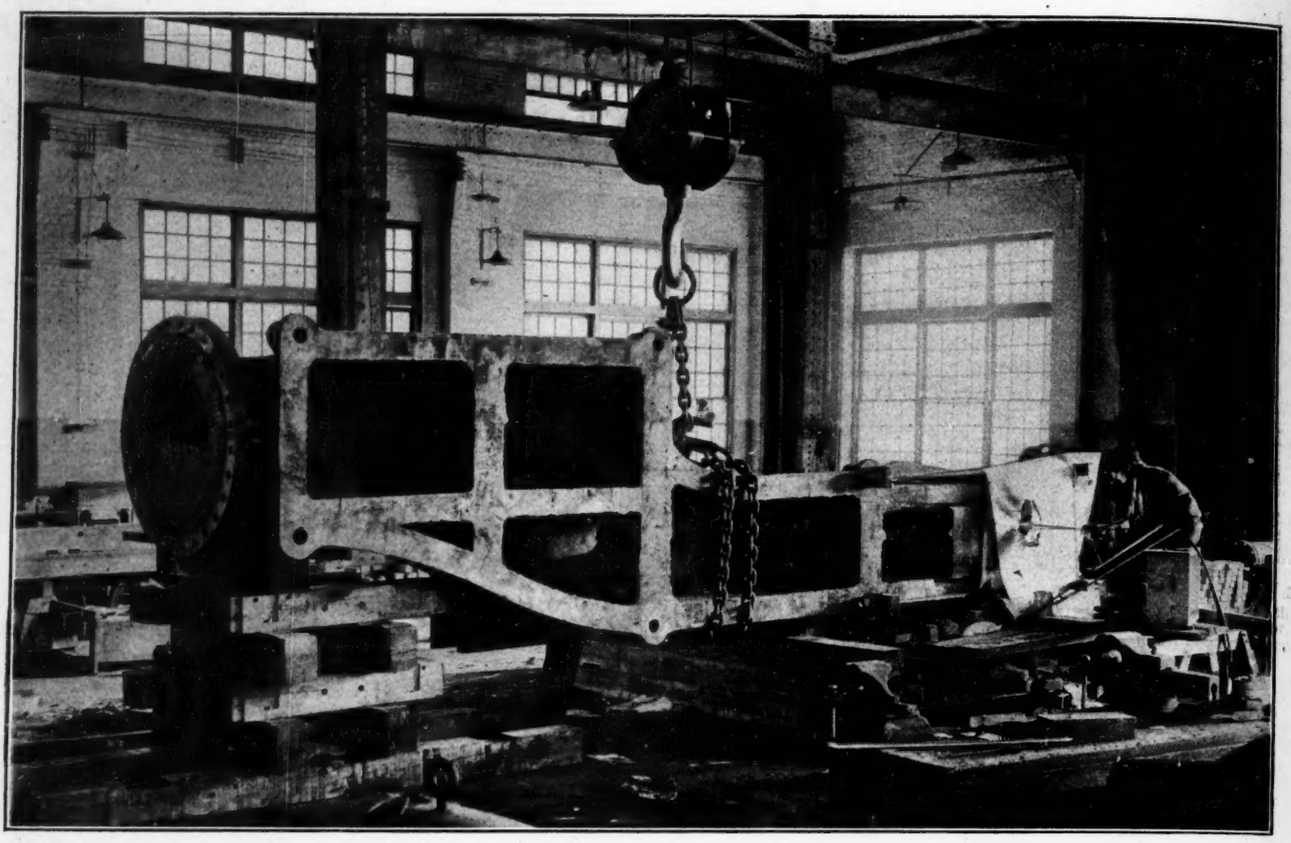

FIG. 4. WELDING THE ENGINE FRAME IN THE SHOP
This casting weighed approximately twenty tons. During the welding operation it was necessary to lift and turn the bedplate several times to make a perfect weld, yet the job was completed between Saturday and Monday mornings.

the side and valve-tripping mechanism on the left. In the background appears the lower end of a tank where the flap-valves for its prompt emptying are to be seen.

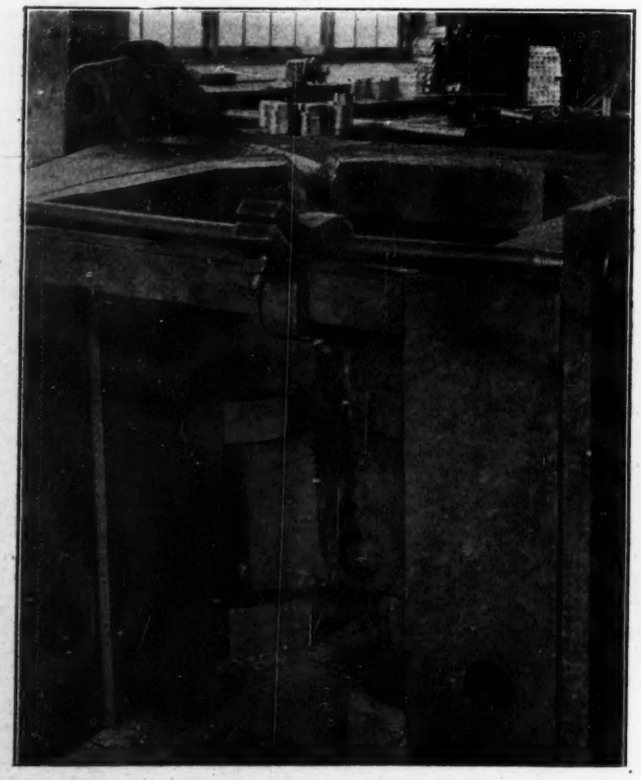

FIG. 5. HOLDING IN PLACE PARTS TO BE WELDED
It was necessary that the two pieces should be held firmly in place in order that the finished job would be suitable for use.

The accident in question began with an overwind. The ascending tank, filled with water, failed to stop at the end of its normal travel and continued its upward flight until it reached the sheave wheel. The cable then snapped and the tank went crashing to the bottom of the 1,000-ft. shaft. On its way it met its mate, breaking its cable, both falling in a common wreck to the sump below. The impact of the blow was so great that the sheave-wheel platform was thrown over at an angle of 45 deg.

FIG. 6. WELD MADE BUT STILL IN THE ROUGH
This shows the two pieces of the frame welded together. The weld has not yet been finished by grinding

With its load released the hoist engine immediately started to race. The automatic control device naturally failed to arrest the rotation of the engine because it operated upon the throttle. The brake bands became

FIG. 7. ANOTHER VIEW OF THE SAME WELD
The pieces were so held during welding that the finished job was only $\frac{3}{32}$ in. smaller than the original casting

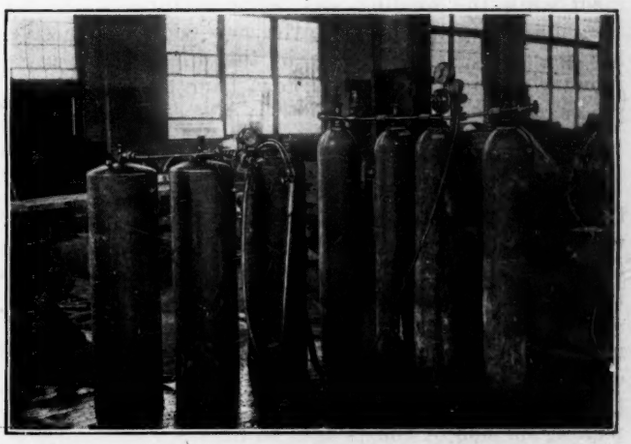

FIG. 8. CYLINDERS CONNECTED BY MANIFOLDS
As the welding job was a long one the cylinders were joined to obviate the need for changing cylinders when exhausted

red hot and tore apart. Finally the engine's mad career was ended when the right bed frame broke in two, directly under the main shaft. In the meantime, however, the cable on the right drum was whipped about the room, scattering débris right and left, while the cable on the left drum was wound up in the reverse direction.

Torch Cuts Rope and Structural Iron

The oxyacetylene cutting blowpipe was first brought into play to clear away the masses of rope. The concrete wall of the building nearest the drums was cut away to enable workmen to get at the cables and to provide an opening for removing the wreckage. Here the blowpipe was used to good advantage in cutting through the structural iron of the wall. In spite of the many strands in a rope the cutting blowpipe severed them all quickly and easily.

When the engine was examined the bed frame on either side was found to have shifted and sheared off the anchor bolts. These bolts were later welded together, which saved an immense amount of work that would otherwise have been required to embed new anchors in the concrete foundation. The right bed frame was cracked entirely across beneath the 22-in. shaft, as may be seen in Fig. 3. The main bearing cap was broken also.

To give an idea of the size of the job it may be said that the over-all dimensions of this engine are: Width, 35 ft.; length, 45 ft. The cylinder bore is 42 in. and the stroke 60 in. The broken bed plate was 22 ft. 6 in. in length and weighed approximately twenty tons. Figs. 3 and 4 give an excellent idea of the extent of the break, while Fig 5 shows how the fracture was opened up by chiseling out a V-groove preparatory to welding.

The latter view also shows how the two parts of the bed frame were clamped together to preserve the align-

FIG. 9. SECTIONS OF THE 8-IN. AIR LINE THAT FELL DOWN THE SHAFT
The battered ends and flanges of some of these sections give evidence of the force with which this pipe was precipitated into the sump. Note how one of the tubes which fell on a timber sank deeply into it so that it closed the end of the tube as a cork closes a bottle. The air line was cut by the oxyacetylene torch, and the pieces were passed out and piled in the gangway.

ment while the welding was being performed. It became necessary to cast an entire new end piece for the bed frame. This was done in the mining company's foundry after making the pattern from the drawing of the engine.

Engine Frame Welded in About Two Days

Operators from the Newark welding department of the Oxweld Acetylene Co. were engaged to do the actual welding of the bed frame. In joining the new casting to the old frame it was highly important that the opening for the shaft be kept within the original dimensions so that the bearing wedges would fit securely. As a matter of fact the welding was done so expertly that the opening was just ⅛ in. less than the distance calculated. Compensation for this discrepancy was easily made by planing off one of the wedges to fit.

The superintendent of the Oxweld Co.'s Newark welding shop and three of his operators performed the work, assisted by several of the coal company's helpers. The operation of welding started Saturday morning and was finished on the morning of Monday following, the men working in shifts each about four or five hours in duration. Fig. 4 shows how the bed frame was supported and handled. It had to be turned three times during the progress of the work. Several layers of asbestos paper retained the heat of the preheating fire and acetylene flame and also shielded the operator.

Fig. 6 is a view corresponding to Fig. 3, showing the completed weld, while Fig. 7 shows the reverse side. In each case they show the work as it appeared before it was finished by grinding away excess metal.

To insure an ample supply of oxygen and acetylene and thus avoid the delay and inconvenience of frequently changing cylinders, several of these containers were connected in battery by means of manifolds as illustrated by Fig. 8.

Clearing Away Wreckage in the Shaft

In falling down the shaft the water tank did much damage to the casing and to the 8-in. compressed-air pipe which, set snugly in one corner, extended down the full depth of the shaft. Here again the oxyacetylene process was put into operation.

About four hundred feet of the lower end of the pipe was ripped out by the impact of the falling tank and piled up in heaps at the bottom of the shaft. The difficulties of removing this tangled mass may be imagined when it is considered that a tank 30 ft. long and 5 ft. in diameter, part of its hoisting rope and chain, 400 ft. of 8-in. pipe and other miscellaneous débris had become wedged into the 7 x 11-ft. compartment of the shaft and into the sump, which extended about 70 ft. below the landing. All of this material had to be removed through the narrow gangway at the bottom of the shaft.

The first step was to make secure against falling the 600 ft. of pipe which still remained in the upper part of the shaft. This was done by lashing it to the shaft timbers, the men reaching the pipe from the adjoining compartment. Next a temporary roof was built over the wreckage to protect the emergency crew from water and falling objects. The sump was pumped dry and the tank was loosened by dynamite.

The tank was then pulled up to the level of the gangway and was cut by the oxyacetylene process into pieces of a size suitable for handling; likewise the steel cable was cut into short sections and the pipe was cut into pieces averaging 8 ft. in length. Three helpers removed all this wreckage through the gangway and piled it into cars in an adjoining mine passage. Fig. 9 shows a pile of this pipe, its distorted flanges and bent walls conveying some idea of the force that demolished the line. It will be noted that one piece of pipe was driven into a shaft timber, filling the end with a plug of wood.

The next step was the removal of the 600 ft. of pipe remaining in the upper part of the shaft. First a new tank was installed and lowered to place. A platform was built on the top of it as a stage from which men could work. Proceeding from the lower end upward, the pipe was cut into pieces as long as practicable. These pieces were lashed to the tank and lowered to the bottom of the shaft.

Pipe Was Cut at the Shaft Bottom

The lengths of pipe thus removed were cut into pieces about 8 ft. long at the bottom of the shaft. It is easy to understand that the work of cutting could be more conveniently performed there than suspended in mid-air between the surface and the landing. The men worked under many difficulties, not the least being the water which fell in torrents down the shaft. The operator and helpers each wore two oilskin suits, as a single outfit would have afforded little protection in the continuous downpour.

In spite of all the difficulties encountered, the entire job of cutting away the wreckage and pipe was completed in thirty-two working hours. It was estimated that at least three weeks would be required to accomplish the work by means of sledges and chisels. Furthermore, the oxyacetylene method was much safer, as the jarring necessarily arising from hammering might have introduced additional hazards, for it might have so loosened the pipe as to cause it to fall.

Although the oxyacetylene process is actually more economical than other means of accomplishing such work, as has been above described, an even greater advantage is often secured in times of emergency, because it enables the regular production to be resumed with minimum delay. Self-contained oxyacetylene units consisting of an oxygen and a dissolved-acetylene cylinder, blowpipes, hose, gages, etc., all mounted on a two-wheeled hand truck are found to be highly compact and convenient for use in an emergency.

Will the Government Acquire Coal Mines?

NOTING the diminishing oil supply, forcing the use by army transports, naval and merchant vessels of coal, with the possibility that available coal fields may be exhausted or advance in value, Senator Cummins, of Iowa, has introduced S. Res. 361 for an investigation by the Senate Naval Committee to cover the following points:

Is it probable that government vessels equipped for oil will be compelled to use coal?

Where are the coal fields from which coal of proper quality for ships can be mined situated?

What is the transportation cost of moving coal from fields to United States ports?

Would it be good policy for the government to acquire such of these coal fields as may be necessary to furnish supply that will be needed for government ships and merchant marine; and what would be the probable cost of acquiring them at this time, assuming that it is desirable that the country be assured of an adequate supply of coal for these purposes for a reasonable period?

What Barrier Coal Has Been and Should Be Left to Protect Anthracite Mines—II

Various Formulae Have Been Developed for Determining the Size of Barrier Pillars — While These Do Not Exactly Agree with Each Other They Give Vastly Better Results Than Mere Guesswork

By W. B. RICHARDS *
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As to the method to be employed in determining the width of barrier pillars, mining authorities differ considerably. An arbitrary rule for the width of these pillars adopted by a number of coal companies and the state mine inspectors of the anthracite districts of eastern Pennsylvania is as follows: Multiply the thickness of the bed in feet by 1 per cent of the depth below drainage level, and add to this five times the thickness of the bed. This rule applies chiefly to flat beds. Table I shows the size of barrier pillars required by this rule.

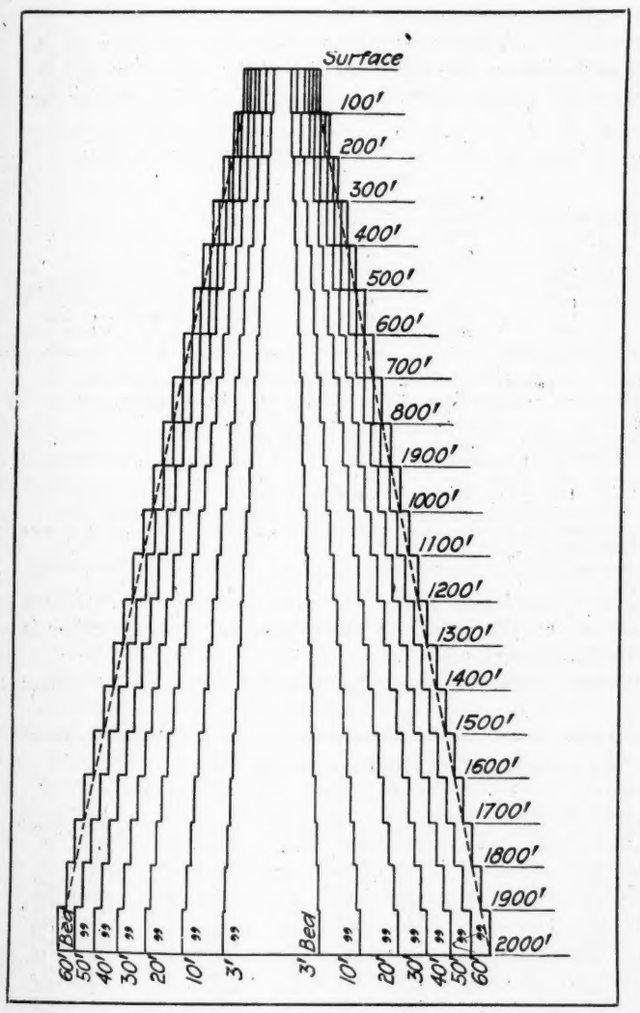


FIG. 8. VERTICAL SECTION OF IDEAL PILLAR

This illustrates the width of pillar necessary for various thicknesses of beds and for varying depths of cover as based on Table I. It is an arbitrary table adopted by a number of coal companies and state mine inspectors of eastern Pensylvania.

*Consulting Engineer, Cranberry Creek Coal Co.

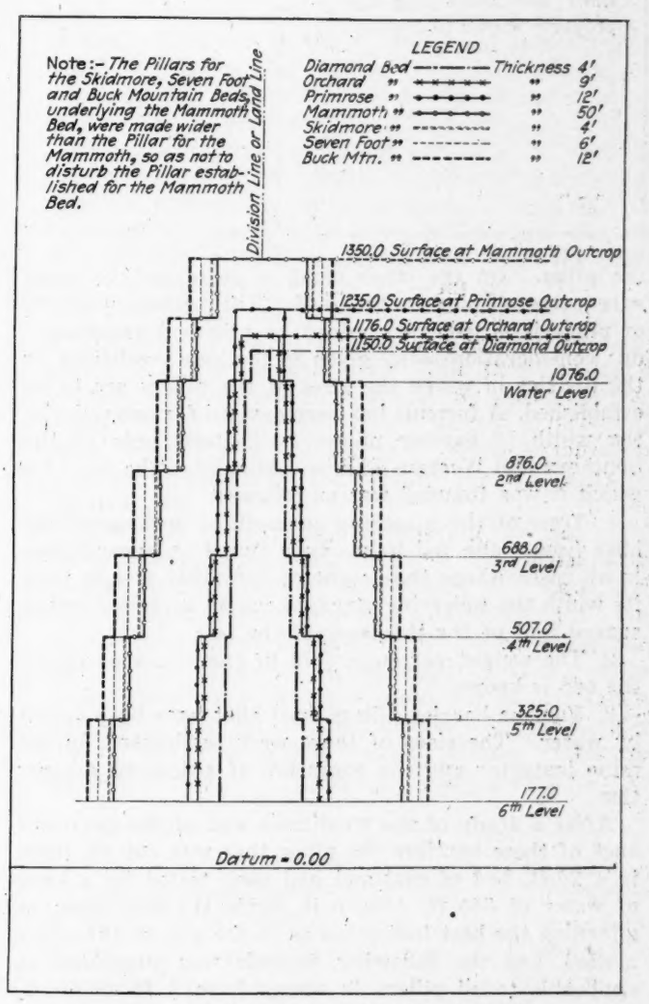


FIG. 9. LONGITUDINAL SECTION THROUGH A THEORETICAL BARRIER PILLAR

This pillar is assumed as existing between adjoining mines and extending parallel with the inclination of the bed.

In the Southern and Western Middle anthracite coal fields of Pennsylvania the beds incline anywhere from zero to 90 deg. and at many places have an inverted dip, particularly along Sharp Mountain, which lies on the southern rim of the Southern coal fields. In flat beds the size of the pillar required depends chiefly on its depth from the surface and to a less extent upon the thickness of the coal.

In such beds lateral draw does not complicate the situation as much as in tilted beds, where the inclination increases the uncertainty as to what will be the effect of that draw on the strata overlying the bed. Inclination also gives the roof a tendency to slide over

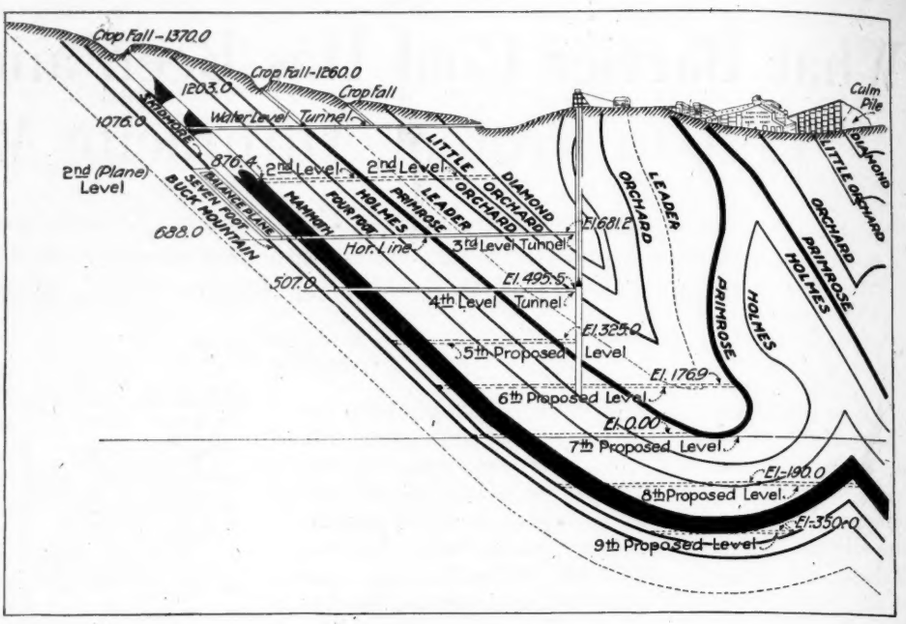


FIG. 10

Cross Section Through the Shaft

This shows the relative position and sizes of the beds penetrated by the shaft and underlying the property shown in Fig. 17.

the pillar. On the other hand, it decreases the pressure perpendicular to the roof. The necessary width of pillar is largely determined by practical experience, due consideration being given to the local conditions in the district in which the sizes of the pillars are to be established. A formula has been devised for determining the width of barrier pillars in inclined beds in the Southern and Western Middle coal fields. The basis on which it was founded was as follows:

1. Tests of the squeezing strength of anthracite coal have been made and it has been found in general that in all cases where the height of the pillar is less than its width the squeezing strength varies inversely as the square root of the thickness of the bed.

2. The weight per cubic foot of the strata overlying the bed is known.

3. Various barrier pillars exist that have been tested by water. The sizes of these were established by the mine inspector and the engineers of adjoining properties.

After a study of the conditions and of the performance of these barriers the pillar that was 300 ft. thick in a 20-ft. bed of coal and had been tested by a head of water of 645 ft. (No. 6 in Table II) was taken as affording the best indication as to the size of the pillar needed, and the following formula was suggested as applicable to all pillars in seams from 3 ft. to 60 ft. thick and less than 2,000 ft. deep:

$$W = W' \frac{\sqrt{t}}{\sqrt{20}} = 0.2236\, W' \sqrt{t}$$

Where W = Required pillar width for a pillar t ft. high, W′ = Required pillar width for a pillar 20 ft. high based on the rule that the pillar should be 100 ft. wide for the first 100 ft. of depth and 25 ft. wider for every additional 100 ft. of depth, and t = Thickness of bed in the workings for which the barrier pillar is to be determined.

This formula gives the widths that barrier pillars

TABLE II. DATA AS TO WATERTIGHT ANTHRACITE BARRIER PILLARS

	Pillar Width, Feet	Depth from Surface, Feet	Head of Water, Feet	Thickness of Coal, Feet	Breast Pillars
(1)	180	425	323	10	In place
(2)	200	450	205	12	Robbed
(3)	300	570	455	23	Robbed on both sides
(4)	185	550	251	23	Robbed on one side
(5)	175	600	390	10	Robbed on one side
(6)	300	800	645	20	Robbed on both sides

TABLE III. DATA AS TO ANTHRACITE PILLARS WHICH ALLOWED WATER TO PASS THROUGH THEM

	Pillar Width, Feet	Depth from Surface, Feet	Head of Water, Feet	Thickness of Coal, Feet	Breast Pillars
(1)	45[1]	300	45	30	
(2)	130[2]	600	235 and 415	16	Standing

[1] Water percolated through this pillar as also through one 80 ft. thick.
[2] Pillar was squeezing and cracking, and water passed through it in large quantities.

TABLE I. SIZE OF BARRIER PILLARS TO BE LEFT BETWEEN ADJOINING PROPERTIES

At Water Level, Ft.	Thickness of Bed, Ft.	Depth Below Water Level: 100 Ft.	200 Ft.	300 Ft.	400 Ft.	500 Ft.	600 Ft.	700 Ft.	800 Ft.	900 Ft.	1,000 Ft.	1,100 Ft.	1,200 Ft.	1,300 Ft.	1,400 Ft.	1,500 Ft.	1,600 Ft.	1,700 Ft.	1,800 Ft.	1,900 Ft.	2,000 Ft.
15	3	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75
25	5	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125
50	10	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
75	15	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	375
100	20	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500
125	25	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600	625
150	30	180	210	240	270	300	330	360	390	420	450	480	510	540	570	600	630	660	690	720	750
175	35	210	245	280	315	350	385	420	455	490	525	560	595	630	665	700	735	770	805	840	875
200	40	240	280	320	360	400	440	480	520	560	600	640	680	720	760	800	840	880	920	960	1000
225	45	270	315	360	405	450	495	540	585	630	675	720	765	810	855	900	945	990	1035	1080	1125
250	50	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250
275	55	330	385	440	495	550	605	660	715	770	825	800	935	990	1045	1100	1155	1210	1265	1320	1375
300	60	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500

Each adjoining owner is to leave one-half of the pillar thickness required. The formula used in this case is:—(Thickness of workings × 1% of depth below drainage level) + (thickness of workings × 5) = Width of barrier pillars.

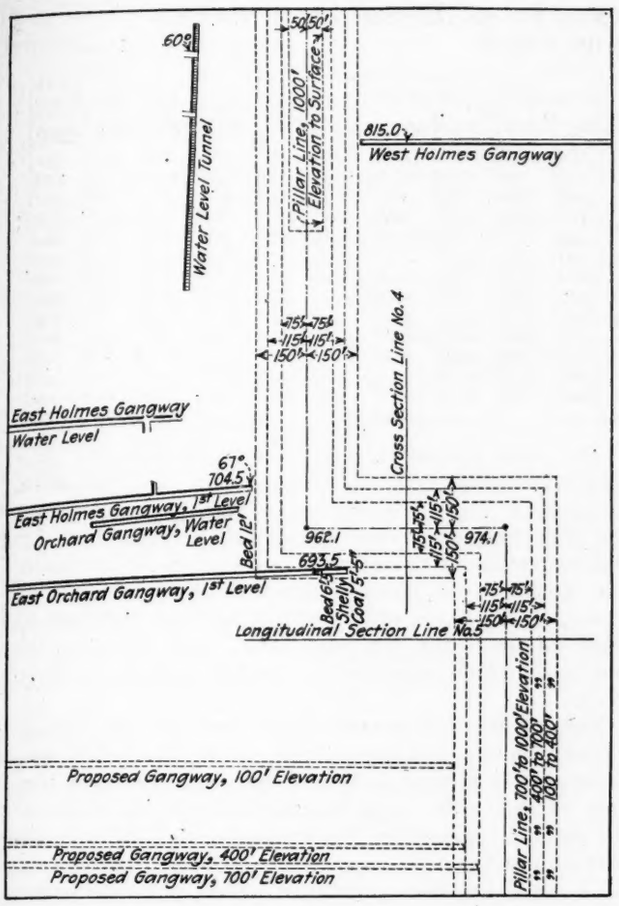


FIG. 11. A BARRIER PILLAR ESTABLISHED BETWEEN ADJOINING MINES

This shows clearly how the pillar width increases or should increase with the depth of cover. The pillar takes a turn to suit a twist in the land line.

should have as has been deduced from pillars that have been tested in mines that were filled with water. Some of the pillars tested, as noted above, were watertight, while the water percolated through the others in large quantities. It gives, as is to be expected, greater widths than were provided in those cases where the water percolated through the pillar.

The accompanying table (Table IV) shows the width of barrier pillars to be reserved between adjoining properties in anthracite mines. The widths shown in this table are to be used solely for determining the pillar thickness in flat or lightly inclined beds pitching from zero to 25 deg., and where the coal is hard and firm. Where the beds slope from 25 to 90 deg., or where they are dirty or shelly, or where the coal though hard contains slips or fractures and again where the coal tends to run across the pitch, and thus decrease the resistance of the established pillar, a 5- or 10-per cent allowance should be added to the width of the pillar specified in the table. Water under pressure will percolate for some distance through dirty, shelly, slippy or fractured coal or through coal running across the pitch.

Where the beds are in a heavy or inverted dip, as in Sharp Mountain, and where the coal also is dirty and shelly from 10 to 20 per cent should be added to the width shown in this table. By comparing the figure for pillar width in Table IV with the actual pillar in case No. 5 of Table II it is found that whereas the pillar is 175 ft. wide, Table IV calls for 160 ft. Likewise in case No. 4 of Table II the pillar was 185 ft. wide, whereas Table IV would call for a width of 250 ft. In case No. 3 of Table I the width of the pillar provided was 300 ft., whereas Table IV calls for a width of only 235 ft. These pillars were all watertight.

The pillar in case No. 2, Table II, was 130 ft. wide. Table IV would require the providing of a 200-ft. pillar. The water percolated through this pillar in large quantities, and it was doubtful if enough coal had been left for safety.

According to Eytelwein, the strengths of pillars vary as the cube of their breadth. By comparing the actual pillar which is 130 ft. wide with the tabulated pillar of 200 ft. width it will be seen that the latter would give a factor of safety of about 3. Taking the pillar No. 4 of Table II, which is 185 ft. wide, and comparing its width with the call of Table IV, which is 250 ft., and assuming that this width is safe, the factor of safety of the pillar as given in Table IV would be 2.

By checking the conclusions in Table IV with the pillars reserved under tunnels that have been tested and were not affected by the lateral draw, I found that the table agreed closely with these pillars, and that the widths shown in the table were safe as far as the lateral draw was concerned.

In determining the proper size of barrier pillars it is impossible to give exact rules or formulæ that would be universal in their application. Each mine is a special problem, and it is well to ascertain the successful practice in the field where the mine is located or in similar fields under the same conditions. Practice, however, even where conditions are similar, should not be followed blindly.

Since the width of pillars as shown in the table agrees closely with the general practice in the Southern anthracite field, I believe it can be used as a guide, with modifications, of course, to suit local conditions. Any modification, however, should be based on the experience and the judgment of the person in charge of the work. Great care should be exercised in determining the size of these pillars, and a large margin of safety allowed where experience has not already determined the best dimensions. A barrier pillar should be fixed

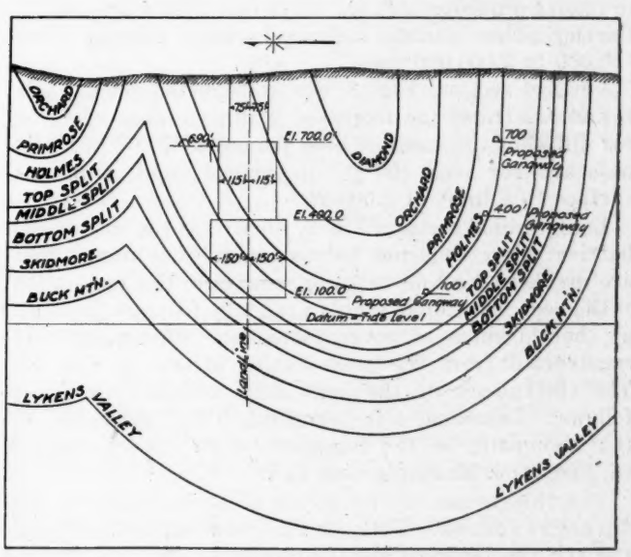


FIG. 12. CROSS-SECTION SHOWING PILLAR ESTABLISHED LENGTHWISE WITH THE STRIKE

This is the pillar shown in plan in Fig. 11. A depth of about 900 ft. has been attained.

TABLE IV. WIDTH OF BARRIER PILLARS TO BE RESERVED BETWEEN ADJOINING PROPERTIES

THICKNESS OF BED	VERTICAL DISTANCE FROM THE SURFACE TO THE LEVEL IN THE MINES WHERE PILLARS ARE TO BE ESTABLISHED																			
	100'	200'	300'	400'	500'	600'	700'	800'	900'	1000'	1100'	1200'	1300'	1400'	1500'	1600'	1700'	1800'	1900'	2000'
3'	39	48	58	68	77	87	97	106	116	126	135	145	155	164	174	184	193	203	213	222
5'	50	63	75	88	100	113	125	138	150	163	175	188	200	213	225	238	250	263	275	288
10'	71	88	106	124	141	159	177	194	212	230	248	265	283	301	318	336	354	371	389	407
15'	87	108	130	152	173	195	217	238	260	281	303	325	346	368	390	411	433	455	476	498
20'	100	125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575
25'	112	140	168	196	224	252	280	307	335	363	391	419	447	475	503	531	559	587	615	643
30'	122	153	184	214	245	275	306	337	367	398	428	459	490	520	551	581	612	643	673	704
35'	132	165	198	231	264	297	331	364	397	430	463	496	529	562	595	628	661	694	727	760
40'	141	177	212	247	283	318	354	389	424	460	495	530	566	601	636	672	707	742	778	813
45'	150	188	225	263	300	338	375	413	450	488	525	563	600	638	675	713	750	788	825	863
50'	158	198	237	277	316	356	395	435	474	514	553	593	632	672	712	751	791	830	870	909
55'	166	207	249	290	332	373	415	456	497	539	580	622	663	705	746	788	829	870	912	953
60'	173	217	260	303	346	390	433	476	520	563	606	650	693	736	779	823	866	909	953	996

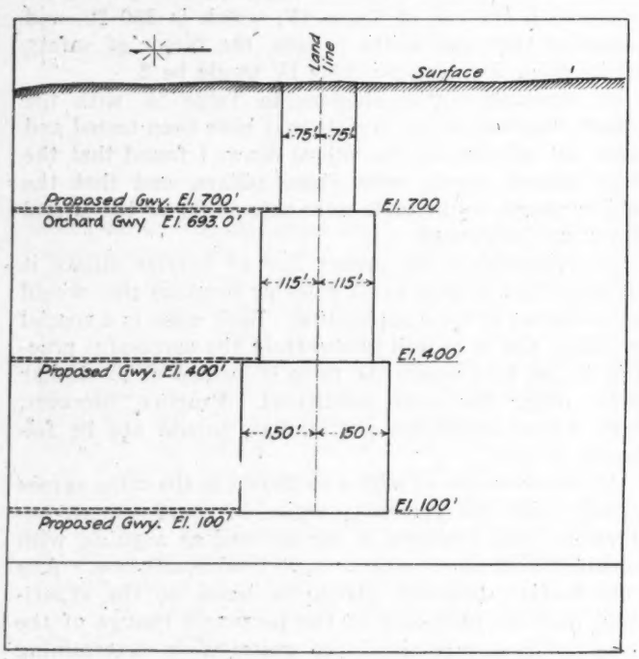


FIG. 13. LONGITUDINAL SECTION OF THE PILLAR SHOWN IN FIG. 11

from a safety standpoint, but care should be taken not to render unrecoverable any more coal than is necessary. Barrier pillars contain a large tonnage, varying from 100,000 to 2,000,000 tons.

Vertical section, Fig. 8, was constructed from Table I, and illustrates the increased width of pillar required for different thickness of beds from 3 to 60 ft. in thickness and for each 100 ft. of vertical depth from the surface to a limit of 2,000 ft.

Longitudinal section, Fig. 9, illustrates the theoretical barrier pillar required between adjoining mines that are divided by a line running parallel to the inclination of the bed. The pillar should gradually increase in width as the thickness of cover increases. This pillar was constructed from the cross-section shown in Fig. 15. The thicknesses of the beds were assumed to be as follows: Diamond, 4 ft.; Orchard, 9 ft.; Primrose, 12 ft.; Mammoth, 50 ft.; Skidmore, 4 ft.; Seven-Foot, 6 ft., and Buck Mountain bed, 13 ft.

The thicknesses of the strata at right angles to the dip are as follows: Between the Diamond and Orchard, 150 ft.; the Orchard and Primrose, 175 ft.; the Primrose and Mammoth, 260 ft.; the Mammoth and the Skidmore, 30 ft.; the Skidmore and the Seven-Foot, 50 ft., and the Seven-Foot and the Buck Mountain, 110 ft.

The pillar needed at each level was established by a consideration of the conditions. As the Skidmore, Seven-Foot and Buck Mountain beds are underneath the Mammoth, the pillar established in those beds for the protection of that upper bed has to be increased, and the increased thickness required was determined by using the thickness of the strata between the beds at right angles to the dip, and using Table No. I for the increased width required for the bed under the Mammoth.

Fig. 11 shows a barrier pillar that has been established between adjoining mines. It will be noted that, because of a change in the direction of the land line, part of this pillar runs lengthwise with the strike of the bed, but the pillar for the most part runs in the direction of the dip.

At the water level a width of 100 ft. was established, while at a vertical distance of 260 ft. below the surface the width was increased to 150 ft.; at 560 ft. the width

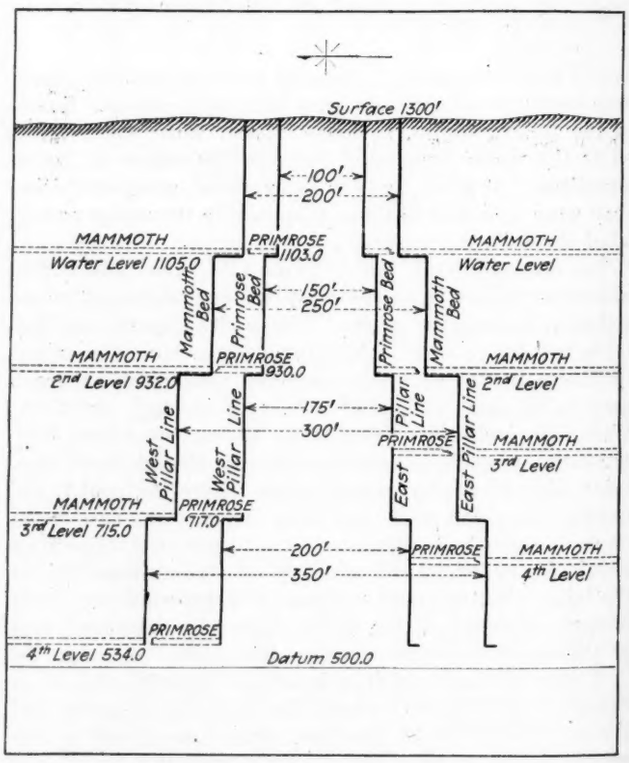


FIG. 14. LONGITUDINAL SECTION OF A BARRIER PILLAR OF VARYING WIDTH

Because of the greater thickness of the Mammoth bed the pillar is made from 100 to 150 ft. wider in this measure than it is in the Primrose bed.

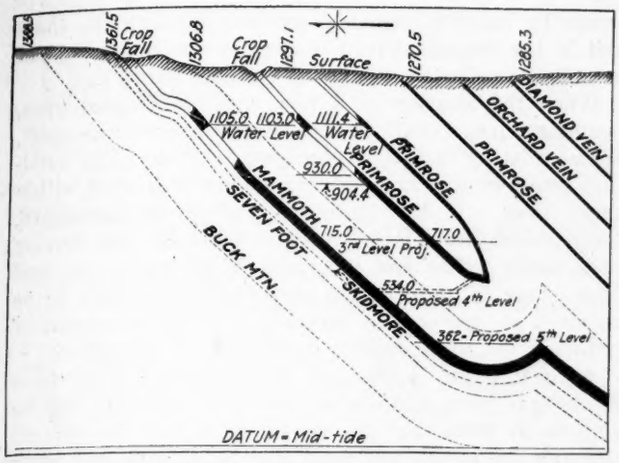


FIG. 15. CROSS-SECTION OF MEASURES WHERE PILLAR SHOWN IN FIG. 14 IS ESTABLISHED

The difference in thickness of the Mammoth and Primrose beds, so obvious in the illustration, has much to do with the pillar width provided. Wholly aside from the purport of the article the contorted position of some of the anthracite coal measures is well worthy of notice.

determined on was 230 ft., and at 840 ft. it was further increased to 300 ft. As shown in the section there are seven workable beds where this pillar is provided and in this case the widths of the pillars were determined to satisfy the needs of the thickest bed, which was 20 ft. thick. The cross-section shown in Fig. 12 is on the line of this pillar. The longitudinal section illustrated by Fig. 13 shows the established pillar.

The longitudinal section, Fig. 14, shows a barrier pillar that has been established between adjoining mines. Attention is called to the two widths of pillar shown; one is for the Primrose bed, which is 12 ft. thick, and the other for the Mammoth bed, which is 40 ft. thick; the inclination of the beds is 46 deg. As measured at right angles to the plane of inclination the Primrose bed is 250 ft. above the Mammoth, and it was not necessary, therefore, to maintain a pillar as wide in the Primrose measure as was required in the Mammoth bed. In the Primrose bed at the water or drainage level, which is 200 ft. from the surface, a pillar 100 ft. wide was reserved, while a width of pillar of 200 ft. was provided in the Mammoth bed. On the second level of the Primrose bed, which is 400 ft. from the surface, a pillar 150 ft. wide was reserved, the pillar in the Mammoth bed being planned at 250 ft. On the third level the Primrose bed, which is 575 ft. from the surface, was provided with a pillar 175 ft. in width, the pillar in the Mammoth bed being set at 300 ft. in width. On the fourth level the Primrose bed, which is 765 ft. from the surface, will have a pillar width of 200 ft., the pillar in the Mammoth being determined at 350 ft. The cross-section shown in Fig. 15 is on line with this pillar.

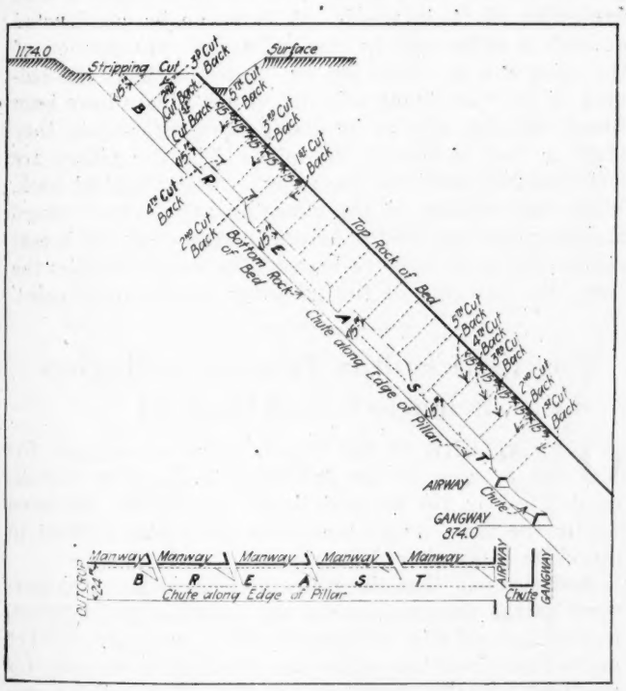


FIG. 16. PLAN OF MINING FOLLOWED NEAR THE EDGE OF A BARRIER PILLAR

This also shows the pitch of the bed and sequence of operations followed in coal removal near the pillar.

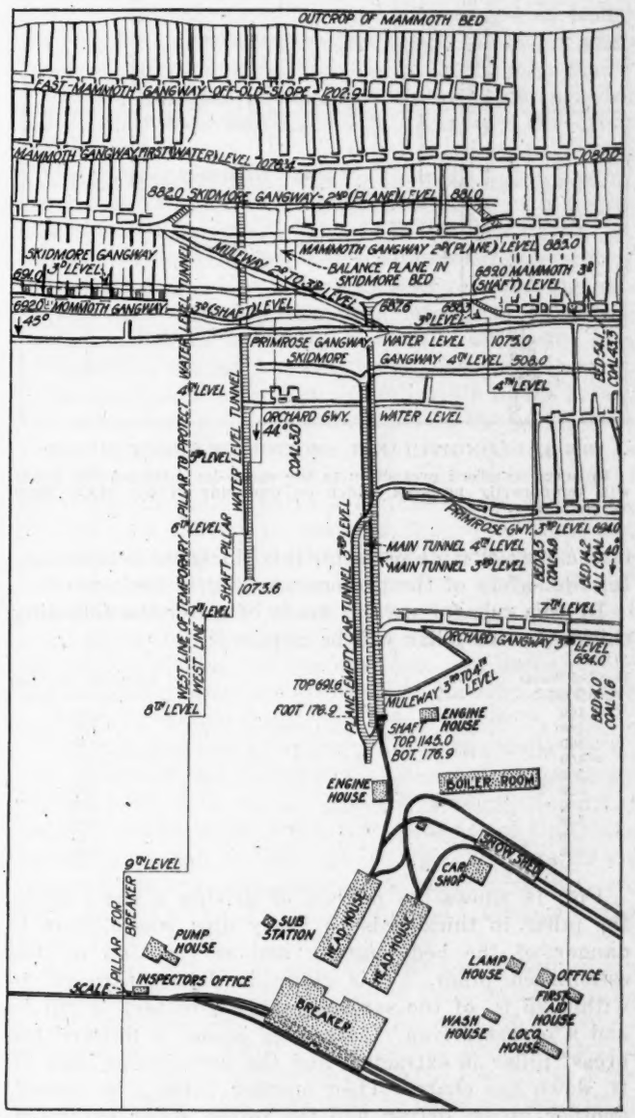


FIG. 17. PLAN OF A SHAFT PILLAR LEFT FOR SURFACE SUPPORT

As will be observed, all surface buildings and railroad tracks are amply protected from injury through subsidence.

The Bituminous Mine Law of Pennsylvania provides that when a mine contains a dangerous accumulation of water the barrier pillar shall be in the proportion of one foot of pillar thickness to each 1½ ft. of water head, if in the judgment of the engineer of the property and

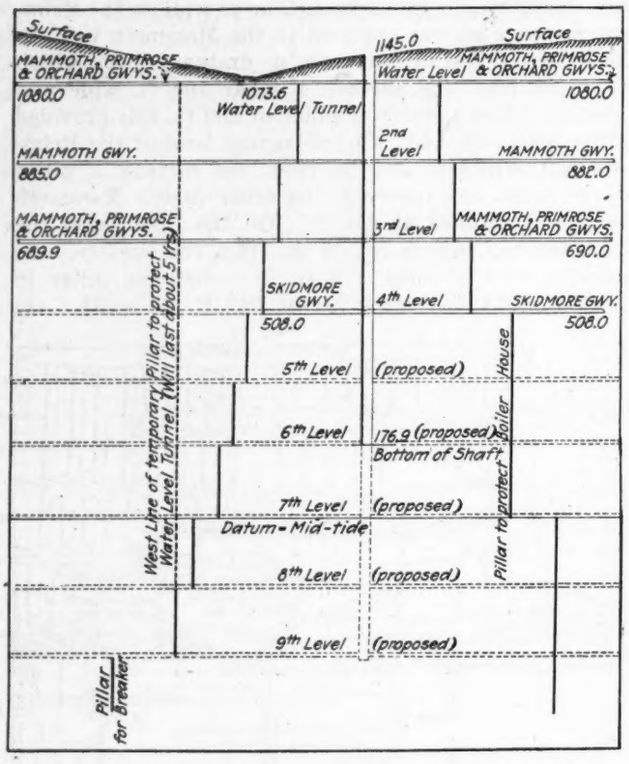


FIG. 18. LONGITUDINAL SECTION OF SHAFT PILLAR

In order to afford protection to the water-level tunnel this pillar will temporarily be kept wider on one side of the shaft than on the other.

of the district mine inspector this thickness is necessary for the safety of the persons working in the mine.

By this rule for various heads of water the following thicknesses of pillar will be required:

Head of Water in Feet	Thickness of Pillar Required in Feet
100	80
200	160
300	240
400	320
500	400
600	480
700	560
800	640
900	720
1,000	800

Fig. 16 shows the method of driving a chute along the pillar in thick beds on heavy dips where there is danger of the bed running and encroaching on the established pillar. This chute is driven through to within 75 ft. of the surface, where a battery is put in and a breast driven. After this breast is finished the breast pillar is extracted, and the work drops back 75 ft. down the chute. Then another battery is erected, another breast driven and the breast pillar extracted, and so on until the coal is mined to the airway. By this method the bed can be controlled and little damage will be done to the pillar by the coal sliding off.

A shaft pillar is the coal reserved on either side of a shaft. This should be of such a width that when the coal is extracted the lateral draw or subsidence will not extend to the shaft nor to the buildings on the surface around the shaft. This coal can be extracted only when the mine is worked out and robbed back to the shaft pillar. Thus it is the last coal to be extracted from the mine.

In determining the width of shaft pillar necessary to protect the main openings and buildings on the surface an engineer can ascertain the nature of the overlying strata by making columnar sections through the shaft and in the tunnels driven to develop the beds, and can establish a pillar to suit the conditions found.

When the location of a new shaft is decided upon, boundary lines should be established around the shaft, approximating to the proposed shaft pillar. The buildings required for the operation should be located within these lines. If the buildings are placed haphazard, their proper protection will make necessary the leaving of a larger pillar and this will tie up much coal, and later some of the surface structures may have to be removed at appreciable expense, in order to permit of reducing the unnecessarily large size of the pillar.

A shaft pillar is reserved to protect the shaft from the lateral draw, while a barrier pillar must not only be sufficiently wide that the lateral draw will not connect through the strata but must also be of sufficient width to withstand a considerable water pressure. A shaft pillar can therefore be 10 to 20 per cent less in thickness than that shown on the table for barrier pillars. This will depend on the thickness of the bed and the depth from the surface.

Fig. 17 shows a shaft pillar that has been established to protect a combined coal and water shaft, water-level tunnel and buildings on the surface. The pillar for the water level is only temporary, and will be required only until the water-level coal has been mined out, when the tunnel can be abandoned. The old slope, water level and second level appearing on the plan were mined years before the shaft was sunk. The present pillar line was established for all levels below the second down to the basin. The cross-section shown in Fig. 10 is on line with this pillar. The longitudinal section, Fig. 18, shows the pillar line in relation to the shaft, tunnel and buildings on the surface.

In the mines of the Lehigh Coal & Navigation Co. fire pillars are provided by leaving every eleventh breast unworked. Chutes are driven on 60-ft. centers, and breasts are made 24 ft. wide. This provides a solid fire pillar 96 ft. in width. A dam can be constructed at such a pillar and in case of a fire that portion of the mine can be sealed off or flooded without the balance of the mine being affected. Such pillars have been found valuable also in localizing squeezes, should they start in that section of the mine. The fire pillars are left standing until the gangway is being robbed back. When the robbing of the gangway approaches toward the fire pillar, a breast is driven in it, so that the breast can be driven up and the breast pillars extracted by the time the stumping of the gangway reaches that point.

Buyer's Default in Payment Authorizes Seller to Cancel Contract

ON FAILURE of the buyer, under a contract for sale of coal to be delivered in monthly installments, to pay for an installment previously delivered within the time agreed upon, the seller was entitled to cancel as to further deliveries.

And the fact that the seller afterward accepted payment of the amount due did not reinstate the contract, in the face of his continued refusal to make further deliveries, since the seller was entitled to recover for the fuel actually delivered whether the contract was cancelled or not. (*Illinois Supreme Court, Chicago Washed Coal Co. vs. Whitsett, 116 Northeastern Reporter, 115.*)

Duplex Water-Tube Boiler Adds Efficiency To Quick-Steaming Qualities

Boiler Has Water-Box Headers and so Omits Sectional Headers and Mud-Drums—Most of the Tubes Are Bent and Thus They Meet the Expansion Strains Which Arise Whenever the Boiler Is Heated

A BOILER recently put on the market seems suitably designed for the production of a maximum of steam with a minimum of trouble. It is a water-tube boiler with two water drums, one in the front and one in the rear. Water tubes pass from the rear drum downward to a water-box header, or water leg, in the front of the boiler, while other tubes criss-cross these, passing from the front drum down to a water-box header at the rear.

Short circulating pipes extend between the drums and the water legs, and these, as will be noted, are protected by insulating material from the heat of the fire. Their purpose is to provide for that circulation of the water in the boiler that is so desirable. The water in the drum is colder than in the water tubes and consequently passes down the circulating tubes to the water legs and replaces in the water tubes the hot water which tends naturally to rise toward the drums. A rapid circulation is thus started which might be impaired if the circulating pipes were allowed to share in the heat from the fire. It is for this reason that they are insulated.

This is known as a one-pass boiler, since the furnace gases pass the tubes once only, but as the criss-cross arrangement of tubes breaks up the gases and prevents them from following their natural course, deflecting them toward the water legs and drums, and as baffles are suitably placed on the water tubes, the boiler gases are well spread and do their work thoroughly, finally delivering their heat to the superheater which is placed immediately over the space left vacant by the criss-crossing tubes.

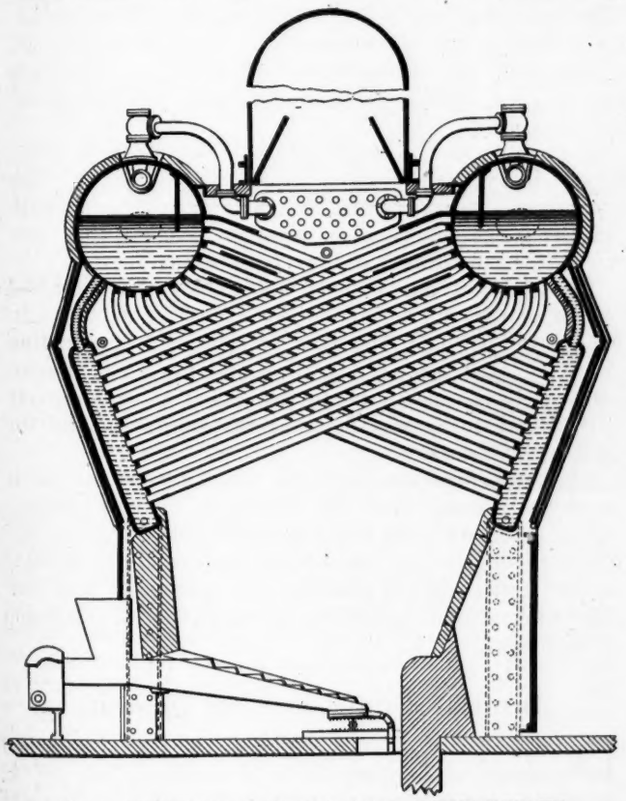


FIG. 1. VERTICAL SECTION OF BURTON BOILER
The multiplicity of water tubes and the even distribution of heat in the boiler provide for a rapid generation of steam and consequently make the boiler compact.

The designer of the boiler, T. Howard Burton, has for years been identified with the manufacture of a single-drum water-tube boiler of the old Worthington type. In this new boiler, although the criss-cross arrangement of the tubes of the older boiler has been retained, the sectional construction has been eliminated, and, as stated, instead of placing individual headers at either end of a tube section, the lower ends of the tubes enter a large water-box header extending the full width of the boiler. The tubes lead obliquely upward across the path of the gases and enter their respective drums. The header is thus eliminated at one end, and the arrangement gives maximum liberating surface for the steam generated, as each tube delivers its contents directly to the drum, thus eliminating the nipple connections between the heating elements and drum common to many types of water-tube boilers. The water legs, being arranged at right angles to the tubes, slope upward and outward at each end of the combustion chamber. An extension of the water leg with blowoff connections eliminates the necessity for a mud drum.

Water connection from the drum to the water leg on the same side and immediately beneath it is made by curved circulating tubes, one end leaving the drum radially and the other end entering the top of the water leg approximately in line with it. The curved tubes are easy to place and make a flexible connection, as they will bend slightly under the contraction and expansion of the boiler parts.

Fig. 1, a sectional elevation, shows how the tubes are arranged in vertical rows of eleven each, adjacent rows sloping in opposing directions. As most of the tubes are curved, they allow for expansion and contraction and tend to reduce the movement at the joints that often causes leakage. The tubes may be cleaned from within the drums and, instead of pulling them out through handholes in the header, they may be removed in the combustion chamber. Both features are big time savers and tend to reduce the time it is necessary to keep a boiler off the line for cleaning or tube removal. An outer shell is provided which may be varied considerably in construction and design.

This design of boiler can be installed in exceptionally low headroom, and the heating surface per square foot of floor space covered is unusually large. By leading the tubes into the drums one-half the header requirement is eliminated and maximum steam-liberating surface is provided. As a consequence the boiler steams rapidly. In the water legs key caps are provided opposite each tube, but the latter may be removed within the combustion space and may be cleaned from

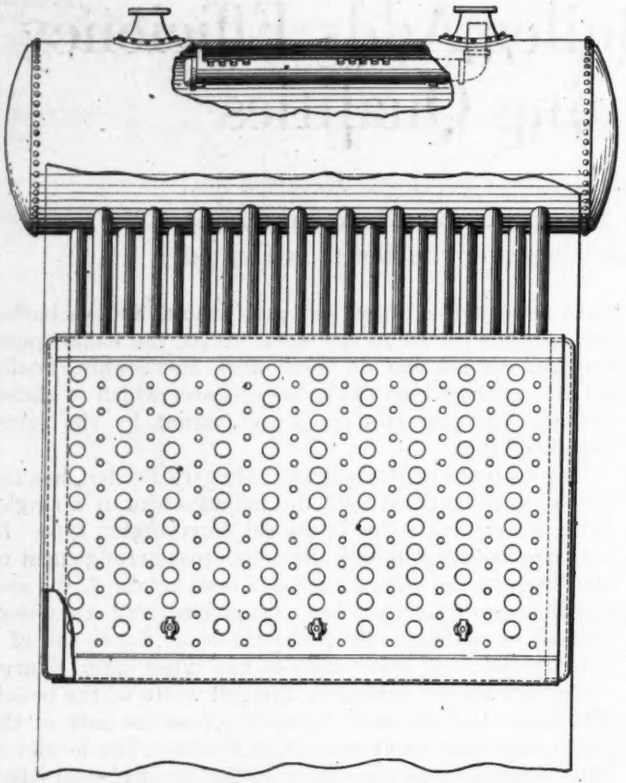


FIG. 2. ELEVATION OF ONE DRUM, THE TUBES AND WATER LEG

Showing the tubes, much foreshortened, passing from the front water leg to the rear drum and also the dry pipe in the drum, which is designed to collect steam free of entrained water.

the drum, so that the frequent removal of caps is avoided. The superheater is conveniently placed and, being in the path of the outgoing gas, tends to insure a low exit temperature. Being centrally located and extending the full width of the setting, the uptake induces an even distribution of the gases over the heating surface. Three soot-blowing elements are provided, and so placed that the soot removed by them falls directly on the grate and is automatically removed with the ashes. The boiler is manufactured by the De Pere-Burton Co., of De Pere, Wis.

Pros and Cons of Low-Temperature Distillation of Coal

Capacity of Retort Is Low—Coke Made Is Weak—Oils Are Apt to Become Resinous—Gas Yield Low Though Gas Is Good

AMONG the many carbonizing processes the low-temperature process has for the past ten years been subjected to a strong searchlight of scientific investigation and public criticism. It has many merits but some of the claims made for it still need the confirmation that can only come by larger-scale operation under the actual working conditions of an established industry.

Its greatest impetus, as stated in *Coal Age*, April 29, was received in Germany during the war. That country, being shut off from all outside oil supplies, was constrained to seek and use coal-distillation methods that would give the maximum yield of liquid products, which requirements were met by the low-temperature process.

Under normal conditions, however, this process has been relatively slow in application and practical extension, because it is approached by most with considerable prejudice. It is highly improbable that it will ever supplant or rival the present high-temperature coke- and gas-making methods; first, because it does not produce a metallurgical coke, but a soft and friable material of poor structure and containing volatile matter from 8 per cent up. This coke would have to find its outlet in the domestic field and in water-gas plants. Secondly, the mechanical operations and speed of coking would militate against its use in competition with the modern byproduct coking plant.

Temperatures employed vary with the different systems. They range between 450 deg. and 650 deg. C., and to produce the best results it is essential that the distillation take place in an oxygen-free atmosphere. The retorts used are either inclined or vertical. Some provide for continuous feeding and others for distillation in a closed retort. Some are made of firebrick and others are of cast iron. The coal capacity of brick retorts for this process as developed to the present probably will not exceed twelve tons per twenty-four hours. Small cast-iron retorts will carbonize 1¼ tons of coal in 4½ hours.

The outstanding value of this entire process is found in the increased yields of byproducts, that is, motor benzol, ammonia and tar. These yields may be two or three times as great as those obtained in coke- and gas-making plants. The increased value of byproducts alone, however, will not pay for the process unless a good and steady market is found for the so-called smokeless fuel it produces. The cost of purification of the oils is considerable and unless the oils are so treated they are apt to become resinous in character and be of no value. Cracking of these oils also is a field for investigation.

As the coke produced by this process is a semi-coke, a good coking coal is necessary if a good coke is desired, consequently low-temperature carbonization of high-ash and non-coking coal probably would not be a commercial possibility.

The nature of the tar produced is pariffinoid in character and in many respects resembles petroleum. The free carbon is low, generally less than 2 per cent, with practically no naphthalene present, because that substance is not formed at low temperatures.

The yield of gas is only about half that obtained in gas works, averaging not in excess of 6,000 cu.ft. per net ton of coal. The calorific value and illuminating powers of the gas are, however, 60 per cent greater, making it possible to dilute the gas if it is to comply with the ordinary specifications for gas to be used for lighting purposes.

The low-temperature process has a future in that it tends to produce what the older and present carbonization processes were not designed to do. Future economic conditions may arise which will push this process to the front, and all possible encouragement and consideration should, therefore, be given to its continued development.

Inspects Tennessee Coal Deposits

DAVID White, chief geologist of the U. S. Geological Survey, in company with L. C. Glenn and W. A. Nelson, is conducting an examination of coal deposits in Tennessee. Mr. Nelson is the state geologist of Tennessee.

Where Stripping Is Regarded as a Regular Adjunct to Underground Mining—I

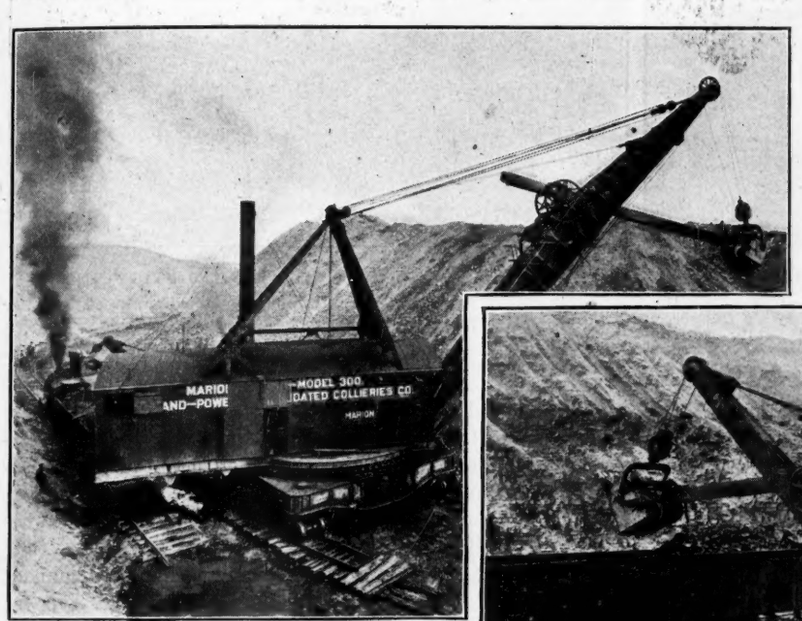
Coal Is Stripped by Steam Shovel from the Outcrop to the Contour, Where the Depth of Overburden Makes Open Mining Prohibitive—From That Line, Which Is Set Where the Cover Is 45 Ft. Deep, to the Boundary Line of the Property Underground Mining Methods Are Employed

By Donald J. Baker
Pittsburgh, Pa.

ONE of the largest operators of combination strip and underground mines in the State of Indiana is the Rowland-Palmer Consolidated Collieries Co. It is fully abreast of the times, which have inexorably decreed that stripping operations shall continue to become larger. Market conditions during the past year have demanded greater economies in labor and a better preparation of coal, and only large and well equipped mines can successfully meet the competition. During our participation in the war and prior to that time the smaller operations, because of imperfect equipment for preparation and lack of care in the excavation of the coal, delivered to the market much poor fuel. It has been hard to overcome the unenviable reputation resulting from this lack of care. The larger pits were never accused of such inadequate preparation, yet to some extent the large amount of poorly prepared coal delivered by small strip pits affected even the reputation of the larger operations.

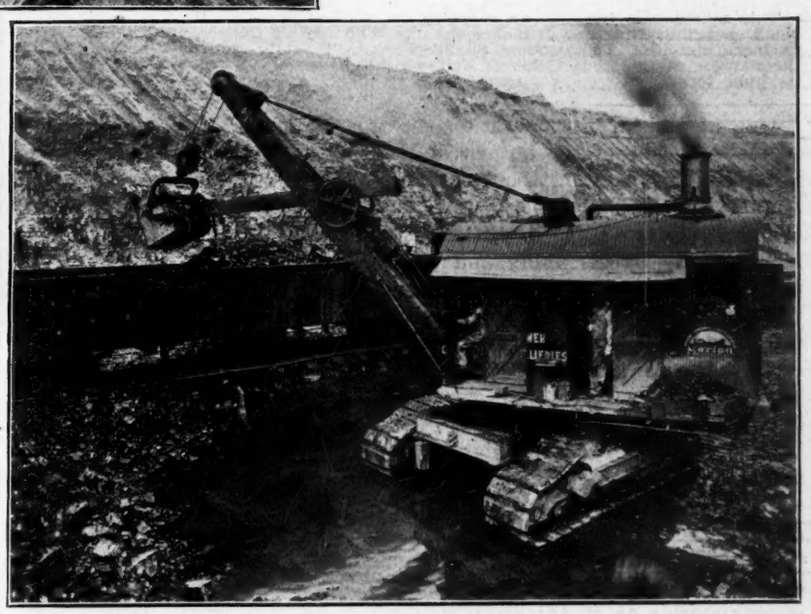
Today a strip pit in Indiana must minimize its use of labor, for is not time work remunerated at the rate of $6 per day? The coal must be most scrupulously prepared, for the Indiana trade is insistent on clean coal and on coal of many sizes. In consequence the initial outlay must be large and to overcome prejudices the preparation must be such as to defy complaint, for the trade has not yet received stripped coal into its good graces. But preparation such as that given the coal from the pit of the Rowland-Power Co. will before long give to strip coal the good repute to which it has title.

At its mines the quality of the prepared strip-pit product so closely duplicates that of the coal from the underground workings that the difference is scarcely discernible except where the coal is taken near the outcrop, and in Indiana the difference even here is not as marked as in coals mined by stripping at points further east.



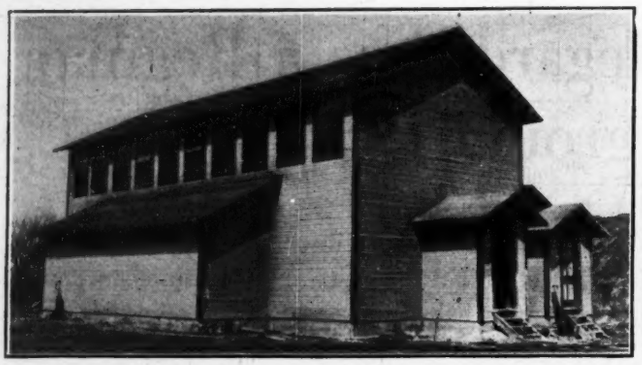
Stripping Cover at No. 9 Mine With a Big Steam Shovel

This shovel is full-revolving and has a veritable "boarding-house reach." Shovels such as this have made "double shoveling" unnecessary.



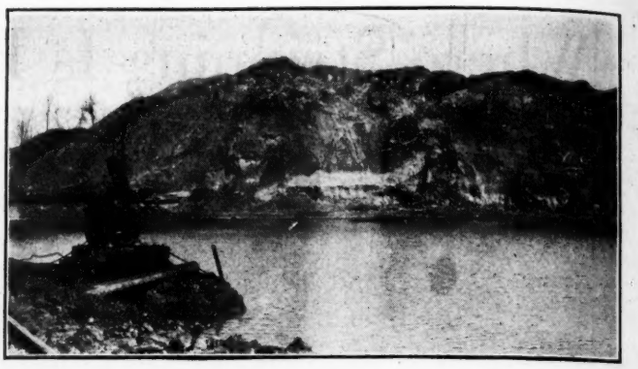
Loading Standard Steel Gondolas At No. 9 Strip Pit

The coal is hauled from the pit in standard cars. The locomotive, however, is a "dinkey." Note the caterpillar tractors that make it independent of railroad tracks.



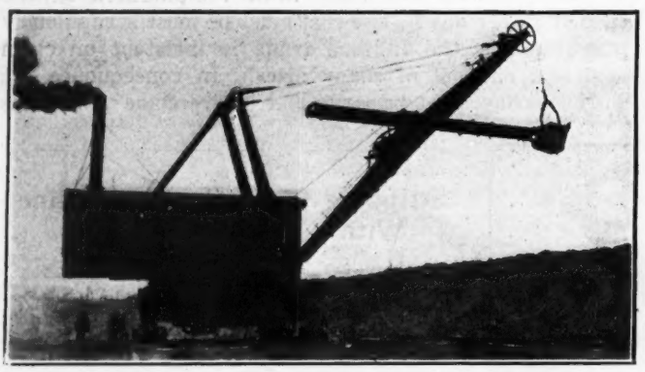
EXTERIOR VIEW OF MINERS' BATHHOUSE

Wings upon either side of the building house the showers while the main portion serves as a dressing and clothes room. The gable entrances make possible the double doors that shield the bathers from drafts.



SUMP HOLDING WATER FROM STRIPPING

Water is voided from this reservoir by the periodic operation of the steam-driven pump on the left. Steam is provided from a locomotive temporarily detailed for that work, the unwatering taking not over two hours.



A 6-CU.YD. BUCYRUS STRIPPING SHOVEL

This machine is here shown working in shallow cover at the No. 3 operation. Note how it makes the men who operate it appear as mere pigmies. To misquote Shakespeare: "It doth bestride the narrow earth like a Colossus and we petty men walk under its huge legs," etc.

COAL-LOADING SHOVEL AT NO. 3 STRIPPING

As in No. 9 operation the smaller shovel is employed only for loading coal onto standard railroad cars that are operated only between the strip pit and the tipple. It will be noted that the material on the bank is such as the stripper seeks and the underground miner would wish to avoid.

One of the largest operations of this company, and incidentally one of the largest of its kind in the state, is located at Staunton, about twelve miles east of Terre Haute. Here 1,000 acres of the No. 3 bed of Indiana coal, averaging 8 ft. in thickness, is under development, partly by stripping and partly by underground mining methods. The bed outcrops along one side of the property and dips in a general southwesterly direction, the inclination averaging about 30 ft. to the mile, or a little less than 0.6 per cent. While the bed is thus relatively level and permits stripping on an extensive scale, yet it can be seen that a point will be reached where stripping will be impractical by reason of the ever-increasing overburden.

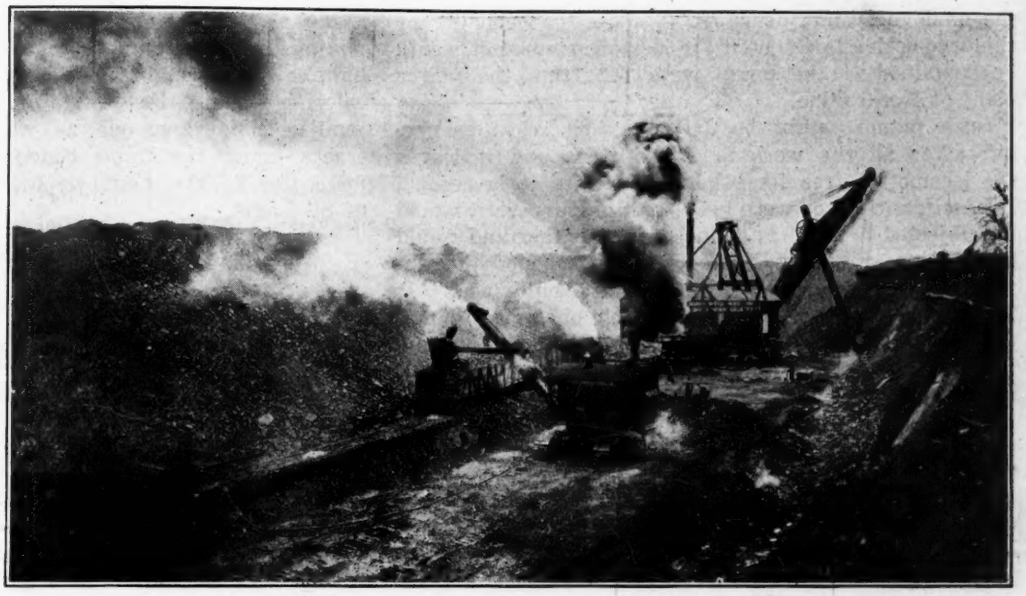
This region of Indiana is fairly level, and the cover over the coal increases uniformly with the dip of the bed. As a result, the coal is stripped from the outcrop line to a point where the overburden becomes approximately 45 ft. thick. When this stage is reached stripping methods are abandoned and the balance of the coal is removed through a shaft that has been sunk at the center to that part of the coal area that is so deep as to forbid stripping.

There are three separate operations at Staunton, two of which are strip pits. These lie on either side of the tract, but are approaching each other as they near the far end of the territory assigned to them. An output of somewhat over 4,000 tons daily is averaged by the three operations. Half of this is credited to the No. 6 mine, which is a shaft development, and the rest to the two strip pits known as Nos. 3 and 9.

The acreage, it will be noted, is a comparatively small one and the life of the property will not be long. Nevertheless great care has been taken in the selection of modern and complete equipment for preparing the output. All structures, it is true, are of wood, so that no large amount of capital is tied up in the surface buildings themselves. It would have been folly to construct buildings of a more or less permanent nature; that is, of either steel or brick. The type of construction chosen in no way interferes with the efficiency of the plant, and the equipment within belies the exterior aspect. Stripping operations are at the best only temporary and the adjoining underground mine at this plant also might be called temporary on account of the small size of the acreage available.

The three operations are situated almost in a line with each other and each is about a half mile from its nearest neighbor. The big shovels at both plants started at opposite ends of the outcrop and worked toward each other. Though the operations at the two strip pits are carried out in a similar manner, the equipment employed differs considerably.

At the No. 3 mine a 225B Bucyrus steam shovel with an 80-ft. boom and a 6-cu.yd. dipper is handling the overburden. A cut about 60 ft. wide is made by this shovel from one end of the territory to the other. The machine then works its way back in the opposite direction. Of the 60-ft. width of coal bed exposed by the stripping shovel only 45 ft. are lifted by the coal shovel, 8 ft. being left to accommodate the railroad tracks and another 7 ft. being provided between the tracks and the bank that is to be worked on the return journey. The leaving of this part of the bench



General View of No. 9 Pit

Both shovels are here seen in operation, the larger moving the overburden and the smaller loading coal. The size of the shovels can be judged when it is recalled that the seam of coal being lifted is eight feet thick.

makes it possible to lay the track for the return trip with minimum delay. The coal shovel is a 35B Bucyrus with a 1½-cu.yd. dipper.

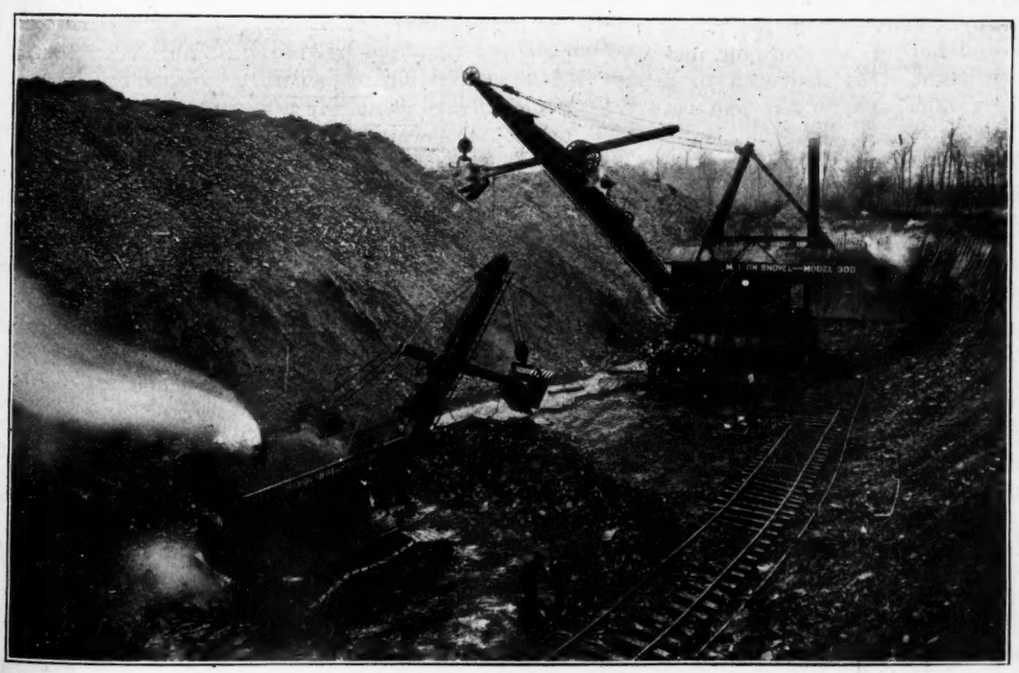
After the larger shovel has removed the cover the top of the coal is cleaned by pick and shovel, brushed with a wire broom and finally washed clean, so that when the small machine reaches the coal it finds it quite clean on top. Throughout the tract a fireclay bed overlies the coal. This is the reason why great care must be taken to clean the top of the bed. The bottom is a firm sandstone and gives no trouble. Holes for shooting the coal loose are put down on 8-ft. centers. At both pits the drilling of these holes is accomplished by means of jackhamers.

Compressor on Shovel Supplies Air Drills

In No. 3 mine compressed air for these drills is supplied through a 1-in. hose line from a Westinghouse compressor installed on the shovel. One stick of explosive suffices to bring down an 8-ft. block of coal. The shots are fired by a storage battery. In both strip pits standard-gage track is used and the small shovels load the coal directly into steel gondolas. Vulcan "dinkey" locomotives haul away the cars from the pit. Two of these are 20-ton while the third is a 30-ton locomotive. By reason of the firm floor on which fortunately the coal rests the product is clean when loaded into the car and but little of the bottom is ever disturbed.

In most strip-pit workings much surface water has to be removed, and this operation is no exception. Here, however, the dip of the bed aids in the solution of the problem. A large sump has been excavated and it serves to collect and hold all this water. At No. 3 pit the water is elevated by a Fairbanks-Morse centrifugal pump to a small stream running near the sump.

The pump is installed on the berm that has been left to sustain the railroad tracks which lead into the pit. This pump is equipped with an 8-in. suction line and a 6-in. discharge. It is operated by steam supplied by one of the locomotives, of which there are more than



One of the Big Shovel Cuts

Compressed air used in sinking shot holes in the coal is supplied by a compressor on the smaller shovel. The sandstone in the floor makes a good pavement for the caterpillars.

the haulage system demands. By use of the boiler of this locomotive is obviated the loss of steam that would be sustained if the pump were fed from the power plant at No. 6 mine.

Such pumps might be driven by electrical energy, but after all the work is intermittent and it leaves the locomotive free for other work when it is needed. If an electric motor were used for this purpose it would be subjected to all sorts of inclement weather and would be liable to frequent breakdowns because of the abnormally severe usage with which it would meet. It is necessary to operate this pump only one or two hours daily. Under these circumstances steam can be furnished with ease by the spare locomotive.

At No. 9 pit, on the other side of the tract, the operating methods are quite similar. The big, or stripping, shovel is of Marion make of the 300 type. It has a 90-ft. boom equipped with a 6-cu.yd. dipper. The coal shovel is a No. 36 Marion of the caterpillar-tractor type and has a bucket capacity of 1½ cu.yd.

In No. 9 Compressor Is on Locomotive

The coal is cleaned and the shot holes drilled in much the same manner as noted in preceding paragraphs. The compressor supplying the air for the drill, however, is not located on the shovel but has been installed on the locomotive assigned to this pit. By this arrangement the compressor is operated whenever the locomotive is waiting for the filling of a car and the coal is shot down during the time the locomotive is engaged in removing a loaded car from the pit.

The loaded gondolas from both strip pits are removed to a centrally-located tipple. Here the cars are placed, one at a time, over a hopper in the shed at the rear of the building. The bottom gates of the cars are opened and the coal passes into the hopper and is distributed evenly upon a housed-in flight conveyor that leads up an incline to the head of the tipple, that structure being built of wood. It was designed and erected by the Link-Belt Co., as was also all the equipment it contains. The exterior appearance of this tipple and its appointments on the inside are quite similar to the plant described in *Coal Age* April 8.

From the head of the flight conveyor on the tipple the coal drops into a second hopper, or conveyor discharge chute, from which point it is delivered to a second conveyor, or picking table, where dirt and refuse coal are removed, the extraneous material being thrown into wooden chutes that lead to one central point at which the rock and slate are loaded into dump cars for removal over one of the railroad tracks beneath the building.

The picking table is located on the upper of the two tipple floors. On the lower floor are mounted horizontal shaker screens, to which the coal from the picking table is delivered. Here the coal can be divided into three sizes or into a combination of any two or more of them. By the proper manipulation of a gate placed ahead of the screen plates the coal may be shunted to a crusher installed on the second floor of the tipple. It may thus be shipped as stoker fuel.

As a result of the careful preparation given in this building the coal loaded is of a high standard of excellence. From the appearance of the loaded cars it is hard to tell the stripped coal from that prepared at the tipple of the No. 6 mine. As a matter of fact some of the stripped product has at times commanded a higher figure than that produced by underground mining from the same bed. Some of the coal under light cover in certain sections of the tract has a higher calorific value. Few strip-pit plants could make a similar claim and one as well substantiated. The tracks under the tipple connect with a spur of the main line of the Pennsylvania R.R. which leads out of St. Louis.

(To be Continued)

Avoiding Inaccuracies in Moisture-Content Determination

Solvents Prevent Oxidation and Retain Volatile Matter and So May Aid in Determination of Moisture in Coal

A NEW method for the determination of moisture in coals is proposed by A. Renfred Myhill in the *Gas Journal*, Vol. CL, No. 2,969, page 21 (April 6, 1920). The method claims increased accuracy and rapidity.

Objection is made to the customary method of drying from one to five grams of coal for one hour at 100 deg. C. The statement is made that "most coals, particularly when in fine powder, evolve a fair amount of volatile matter (other than water) when heated for any length of time at 100 deg. C.," and that "certain oxidizing actions take place." It is admitted, however, that "this error in many cases is not serious." Bodies that will dissolve the volatile matters evolved have been proposed to meet these difficulties and the reviewer agrees that they would prevent oxidizing actions, but is of opinion they would not totally inhibit evolution of volatile matter from the mixture.

The new method offered consists in distilling a mixture of 100 grams of coal with 200 cc. of either benzol, toluol or xylol. The solvent selected must be free from water and must contain fractions boiling at not less than 110 deg. C. The distillation is carried on up to at least 110 deg. C. and the water collecting at the bottom of the receiving cylinder may be isolated and weighed or the volume may be determined and converted into grams by consulting a specific gravity table for water at the temperature of the resulting distillate.

One method employed by the U. S. Bureau of Mines for the determination of moisture in coal consists in drying a small coal sample in a weighing bottle for one hour at any temperature ranging from 104 deg. C. to 111 deg. C. This fact would seem to indicate that the inaccuracies due to the evolution of volatile hydrocarbons from coal at 100 deg. C. is regarded as negligible.

The author states that "the whole test can easily be carried out in from twenty to thirty minues." It should be pointed out that the apparatus would need constant attention during the entire distillation which is not now required in the generally accepted method.

The method proposed by Mr. Myhill would frequently be inapplicable because one hundred gram samples are not always available, and the action of the solvent employed might render the sample unfit for subsequent detailed analyses. It is known that organic solvents under some conditions will alter the structure of the original coal. The effect of this procedure on the constituent of coal requires investigation. Further, the greater amount of apparatus required, the more cumbersome manipulation and the added cost of water-free solvents are objectionable features of this method.

Urges Coal Operators to Meet Problems Through Organization

President Harry N. Taylor in His Address as Retiring President of National Coal Association Tells Coal Men That Their Body Is the Keystone of the Industry—Problems of the Year Reviewed

BY H. N. TAYLOR

IN APPEARING before you for the last time as the president of the National Coal Association it is with a feeling of great pride that I look back over the accomplishments of the past year and the splendid record the National Coal Association has made.

Great as were the achievements of the association during the war period, the National has been called upon to face far greater questions, more vitally affecting the welfare of its members, during the past year of reconstruction than even the great questions which confronted it during the period of actual hostilities.

The war problem was largely one of increased production. During the past year we have been called upon time and again to defend ourselves against attacks which threatened the very life of the industry. Never has the need of oganization been so manifest, and never has the fact that we have so powerful an organization as the National so justified its being.

LOCAL COAL ASSOCIATIONS STRENGTHENED

I desire to point out as briefly as possible some of the principal efforts and accomplishments of the association.

Shortly after the annual meeting of the association in Chicago Mr. Morrow, your vice-president, and myself made a trip into West Virginia and Alabama, meeting with the operators in that section for the purpose of strengthening their local association and their relationship with the National. These arganization trips were followed up by Mr. Morrow and myself, visiting the Iowa Coal Operators' Association, and, together with Mr. William Henderson, the chairman of the Membership Committee, we made an extended trip, meeting with the operators of Missouri, Kansas and Arkansas in Kansas City; with the operators of Oklahoma at Muskogee, the operators of Texas at Dallas, the operators of Colorado and New Mexico at Denver, and the operators of southern Wyoming and Utah at Salt Lake City. Mr. Morrow extended his trip to the State of Washington, returning by way of Montana, so that by personal contact we have reached the operators in almost every section of the country, and have added largely to our membership, and from reports received have aided the strengthening of the local associations which ultimately became members of the National.

Early in June of last year it became evident that there would be a serious shortage of coal in the fall and winter of 1919-1920. Advance information from the miners of their intent to strike in November caused the association to for ma committee to place these facts before the public, and this committee put on a campaign, laying these facts before the public through advertisements in the principal journals of the country, and for this purpose expended $94,447. This campaign yielded almost immediate results, and stimulated the placing of orders at the mines. The Geological Survey reports show an immediate increase in production—I believe largely due to this advertising campaign. It had the further effect of developing the fact that with the normal movement of coal there was an actual shortage of cars.

The association, through its railroad committees, put forth every effort to compel the U. S. Railroad Administration to give proper attention to the transportation of coal, and by co-operating with the Railroad Administration succeeded in obtaining a more effective use of the equipment for the hauling of coal.

INTRODUCED STANDARD ACCOUNTING METHOD

I desire to call especial attention to the work of our Cost Accounting Committee, of which Mr. Thomas Brewster was chairman. It concluded its work, and a standard method of cost accounting for coal mining companies was adopted at the meeting in Kansas City on July 9, and this system has become generally recognized as the best accounting system yet developed for any of the mining industries in the United States. It has been adopted widely by individual companies and has been of the greatest value to the industry as a whole. Especially has it benefited by the approval of this system by the Treasury Department for taxing purposes.

On July 18, 1919, the U. S. Senate passed a resolution introduced by Senator Freylinghuysen, authorizing the investigation by a sub-committee of the conditions of the coal mining industry, alleging that prices had been advanced and production curtailed, against public interest. The National Association quickly compiled the facts, and showed conclusively through evidence of its witnesses before this committee that there had been a decline instead of an advance, and that the real trouble was lack of transportation and improper functioning on the part of the Railroad Administration. The result was that this investigation soon switched from an investigation of the coal industry to an investigation of the Railroad Administration, and through this investigation much publicity was obtained, which put the coal industry in a better light before the public.

INVESTIGATORS DISCLOSED STRIKE PLANS

This investigation developed the fact that the miners had intended using what they term "economic force" to bring about an increase in their wages, even though the public should be frozen out to enforce their demands. The fact that the coal operators had clearly pointed out this situation to the public through their advertisement in June relieved them of stigma when the strike actually occurred in November.

Through the efforts of the National Association in connection with the investigation of the governmental

agencies, production, which had been running at about eight million tons a week prior to August 1, was increased to about thirteen million tons a week prior to the strike on November 1; and this increased production, much of which was in storage on November 1, tided over what would have otherwise been a national calamity due to the nationwide strike put into effect by the miners' union.

Funds Supplied for Production Reports

Because of the failure of Congress to provide sufficient funds for the continuation of the U. S. Geological Survey weekly coal production reports, this association quickly stepped into the breach, and from July 1, 1919, until the present time, has provided the funds to keep this all-important report alive. Your directors realized that a break in this report from July 1 to any subsequent date would throw the production information into a chaotic condition and prevent comparisons in the future for all time to come. Inasmuch as it was vital to the industry that these reports be kept continuous the effort of the association which made possible the continuation of this report for the general information of the industry has been one of its most important works.

The officers of the association have been constantly desirous that the public have a better understanding of conditions in the production and distribution of coal. The U. S. Bureau of Mines called upon the association for financial assistance in the preparation of a moving picture film portraying the operation of coal mines as an educational feature. Your Board of Directors appropriated $8,000 to cover a portion of this expense. This film has been prepared and arrangements have been completed by which it will be shown during this year in the moving picture theaters throughout the country, and it is estimated that 52,000,000 people will see the operation of a coal mine.

The average consumer of coal has at best a vague idea of the items which make up the total cost of production. What is paid the miner per ton is his idea of cost. The fact that there are over two hundred items of cost other than the amount paid the miner is overlooked. The National Association has given wide publicity to a chart showing these two hundred items of cost, and has obtained splendid results in an educational way.

Statistical Bureau a Means of Defense

On Dec. 11 of last year your Board of Directors established a statistical bureau for the assembling of information which should at all times be available for the defense of the industry whenever it might be attacked, as well as for the better information of coal operators and the general public. For this purpose your board made an appropriation of $50,000, and the services of C. E. Lesher, who has been with the Geological Survey, were obtained, and he was established as the head of this bureau. It was through the medium of this bureau that it was possible to assemble the enormous amount of statistical information necessary for the submission of the coal operators' case to the President's coal commission. Although Mr. Lesher has resigned to become editor of *Coal Age*, this bureau is still being maintained and is a vigorously helpful part of the association's organization.

The assembling of current information regarding market conditions, which has been obtained by the association from local associations, has been somewhat disturbed, and has been resumed only in part. Many local associations have not as yet re-established their daily market report, for one reason or another; but the importance of having authentic information properly compiled on hand at all times is vital, and I would urge that the local associations resume the compiling of this information and sending it to the headquarters of the National Association at Washington at the earliest date possible. This information can be compiled and published in the *Coal Review*, the official organ of the National Association, so that it can be in the hands of all coal operators as a barometer of trade conditions.

Figures compiled by the Bureau of Internal Revenue show that in 1918 something like 22 per cent of the companies mining bituminous coal had net losses, and almost a third of this class showed losses averaging 49 per cent on capital invested. At the same time 11 per cent had net income of less than 5 per cent on invested capital and averaged but 1.94 per cent after paying taxes. In fact, 40 per cent of the companies had net profits which, after payment of taxes, left less than 11 per cent on invested capital. Half of our bituminous coal was produced by the 62 per cent of companies that either had deficits or showed less than 11 per cent in profits after paying their taxes to the United States.

Authentic Information Supplied to the Press

The daily press is prone to call attention to the high prices in spots here and there. Nothing is ever said of the millions of tons of coal that are sold at low prices. Correct and authentic information as to the average selling price should be obtainable at all times, and this can only be accomplished through the work of the statistical department of the National. The machinery for this great work has been established by the National Association, and it now is in the hands of the local associations to take the benefit of the organization provided for this purpose by the National. Correct and authentic information is a duty that we owe to the industry and to the public.

Your Board of Directors has set aside $75,000 for educational work. An educational or publicity committee, of which A. M. Ogle is chairman, which committee is working under the supervision of the Finance Committee of our association, of which Mr. J. J. Tierney is chairman, jointly agreed that the *Weekly Digest*, which has been a constant adviser of the coal industry, should be published under the name of *Coal Review*, and become the organ of the National Coal Association and the coal industry. The details of their endeavor will be put before you in the report of the committee.

On Feb. 16 the directors authorized the institution of test suits to ascertain the authority of the Federal Trade Commission to require coal operators to furnish reports of production, cost and income, which the commission had ordered them to submit. The first of a series of actions for this pupose has been brought in the Supreme Court of the District of Columbia, in the name of the Maynard Coal Co., and in the first instance the association has been successful in securing a temporary injunction restraining the commission from requiring the filing of these reports by the Maynard Coal Co. The case will be carried through to establish definitely the rights of the industry with respect to governmental regulation. This case has attracted wide attention, as the findings are vital to many other industries. Congress during the past year has given much thought to, and many resolutions and bills have been introduced, having for their purpose, the investigation of the indus-

try. Construction, rather than reconstruction, is the great task confronting Congress. There is too much Government in business and not enough business in Government. Uncle Sam must be pried out of the coal business, the lumber business, the transportation business, and all other businesses which have been invaded. His right hand must be taken from the throat of private enterprise, while his left hand must be taken out of the pockets of the taxpayers. There is plenty of work for both hands if employed in the administration of legitimate business of governmental affairs.

Every effort toward government ownership must be discouraged and contested. Private capital uncovered and developed the resources of the United States. Private capital opened up to settlement, use and prosperity the places that had been wasted and idle. Private capital footed the payrolls of the laborers who built and ran the railroads. Private capital built and operated the factories. It was the private capital of the farmer that bought and tended the farms and made them productive. Private capital is the foundation and superstructure of all American business. Wages are the biggest bills that private capital pays. The prize for which private capital is competing is general prosperity. It cannot hope to win the race hampered by government control as a weight on one leg and with unreasonable domination of union labor as a weight on the other.

Organized labor seems to have adopted the theory that to work too hard will spoil the job. Their leaders say: "Why increase production when a shortage in supply is the very thing that keeps business alive?" They further assert: "If you allow an over-supply of commodities to develop, we will at once be thrown out of our jobs." This argument is a fallacy. The fallacy lies in confusing individual production with the production of the plant as a whole.

Increase of Men, But No Greater Output

To maintain output during the past four years coal operators and manufacturers have had to employ more men to do the same work. This means higher costs, first, in payrolls; second, in additional mining machines, clerk hire and overhead cost. The higher cost is generally passed on to the consumer in the form of higher living expenses. Still the shortage in production continues, so new companies are induced to start mining or manufacturing, sinking new mines, building new plants and creating what in normal times would be an excess of producing capacity. The effect is plainly seen in the distress of excessive living costs, overstrained credits and over-expanded business. Increasing individual production is quite another thing.

If each workman, by more effective work, adds 25 per cent to his daily output, he supplies the goods that are needed; but he does not add to the producing cost; in fact he cuts down the cost per unit, for he helps get a greater output from the same mine, the same machinery, the same equipment, without increasing the overhead charges. He benefits himself either through higher wages or by lowering the cost of living to consumers, of which he is one. He is able to buy more things, and consequently he increases the demand for goods at the same time that he increases the supply and cheapens the cost.

History does not record an instance where business depression was caused by labor increasing its output of goods per man. The unnatural condition forced by the false logic of shorter hours and less production creates a situation of higher cost, which, in turn, is responsible for the wave of labor unrest, which again in turn breeds Bolshevism. Bolshevism is merely a lazy man's envy of the prosperity of a hustler. The often repeated claim of the Socialist that labor creates the world's wealth is another utter fallacy. The wealth of the world has always been created primarily by intelligence. It is the brain of man that leads in production, and not the brawn.

Capital, after all, is only crystalized labor. Manual labor without the guidance and inspiration of brains has never accomplished anything for mankind beyond a bare existence. When the world gets down to work again we will cure our economic ills, and not until then.

Collective Bargaining Produces Hard Bargains

The coal industry was the first basic industry to recognize the principle of collective bargaining. Since 1898 this method of dealing between the employer and the employee has been in force. Each wage period finds it more and more impossible to reach a settlement. The miners have fully recognized the importance of organization, and with the expanding of their efforts along these lines it becomes more and more difficult for the operators to meet and successfully maintain their position.

Organization is the keynote of industry; 100 per cent organization on one side must be met by an equally well organized body on the other if fair results are to be obtained.

The National Coal Association has made wonderful progress. It has achieved many things; but it must go forward in its effort. Not the least of the association's achievements during the year has been a further growth of mutual sympathy and understanding among coal operators in all parts of the United States, through their association in this organization. The association is not perfect by any means, but if it is to render the service that such a national organization should render it must continue to grow and we must give our serious thoughts to its improvement.

If some of us become dissatisfied because it has not accomplished all that we had hoped, the proper remedy is not to find fault and threaten to withdraw but to take off our coat and go to work and make the organization the powerful instrumentality that this industry ought to have in its national association.

To me it is unthinkable that the coal operators of the United States should ever consider leaving their industry without such an organization as this when the social and public problems which this business must face are so pressing and so serious as they are at the present time. Therefore, I look upon this association as an established institution. Through it the coal business has advanced beyond the dark ages of utter disorganization into the light of union for common purposes and achievement.

To Consider Advisability of Government Acquisition of Coal Fields

OWING to the oil situation and the possibility that Government vessels may be compelled to use coal, Senator Cummins, of Iowa, has introduced in the Senate a resolution directing the Naval Committee to consider the advisability of Government acquisition of coal fields.

Report of Railroad Administration Reveals Financing of Over Four Billions

Statement of Difficulty of Persuading Roads to Accept Allocated New Equipment Complicates Sentiment on the Present Car Shortage—Companies Unable to Pay Cash May Settle with Equipment Trust Notes

A COMPREHENSIVE account of the financing of the United States Railroad Administration, a task involving billions of dollars, is given in the report of Swagar Sherley, director of the Division of Finance, made public May 24 by the Director General of Railroads. Mr. Sherley sketches the history of the financing of the railroads from the beginning of Federal control on Jan. 1, 1918, to date.

One of the interesting features of the report, bearing upon the present situation of the railroads as to equipment shortage, deals with the efforts of the Railroad Administration to induce the railroads to accept the equipment that had been ordered for them. Because of the failure of the Railroad Administration appropriation in March, 1919, construction of equipment of all classes had to be delayed and expenditures kept to a minimum.

After money had been made available, and cars and locomotives had been constructed and allocated, many of the railroad corporations protested strongly, claiming that the cost was excessive and represented a war cost that the Government should bear and that they did not need the equipment. While it is now evident that this and more equipment is needed and that costs are as high or higher, it was not until late in 1919 that the Railroad Administration was able to persuade these roads to accept the equipment.

Government Was Obliged to Advance Money

The estimated balance sheet of the Railroad Administration at the conclusion of Federal control on Feb. 29, 1920, after twenty-six months of Government operation of the railroads, carried totals of $4,493,972,125. Because of the practical inability of the railroad corporations to float bonds or borrow money during and immediately after the war, the Government itself was obliged to advance nearly all money needed for capital expenditures and other purposes. At the end of Federal control, Mr. Sherley's report shows, there was due to the carriers in unpaid compensation and other large items, including all gross interest accruals, $1,476,928,805.60, while there was due from the carriers to the Railroad Administration, including similar interest accruals, $1,677,243,077. Of the amount due from the carriers it is estimated that $815,379,145 properly may be used under the terms of the Transportation Act, 1920, as an immediate offset against the amount due by the Government to the carriers.

Congress appropriated for the Federal control of transportation systems $1,250,000,000, and the Transportation Act of 1920, under which the properties were returned to private control, carried an additional $200,000,000. The following table from Mr. Sherley's report summarizes the loss sustained by the Government in operating the roads:

ESTIMATED EXCESS OF OPERATING EXPENSES AND RENTALS OVER OPERATING REVENUES

Class 1 railroads	$677,513,151.56
Other privately-owned properties (smaller railroads) sleeping and refrigerator car lines and steamship lines)	43,011,129.36
Inland waterways	2,449,738.69
Total	$722,974,019.61
Expense of central and regional organization	13,954,979.69
Deficit, American Railway Express Co.	38,111,741.60
Adjustment of materials and supplies in settlement with railroad companies on account of increased prices	85,204,618.26
Net interest accruals for deferred compensation, open accounts, and additions and betterments	37,558,162.01
Deductions from gross income	10,118,034.36
Miscellaneous profit and loss items	4,894,056.38
	$912,815,611.91
Less non-operating income	12,336,855.35
Total	$900,478,756.56

"The operation of the roads by the Government for the year 1918, together with expenses incident to the water-way operations of the Government, resulted in a deficit for the year of approximately $236,000," says Mr. Sherley's report. "On Jan. 1, 1919, there was to the credit of the Railroad Administration a total of $78,188,531.69, exclusive of the working funds with Federal treasurers. There had accrued as compensation due to railroads a total of approximately $945,017,848 and there had been paid to them either in the form of loans or direct payment on account of compensation the sum of $375,475,412.

"It became apparent that additional appropriations would have to be made by the Congress in order to enable the Railroad Administration properly to carry forward Federal control of the railroads and provide the additions and betterments needed if the roads were to perform their full duty to the public and be enabled to pay the sums necessary to enable the various carrier companies to meet their obligations to their bond and stockholders. Accordingly, there was submitted upon Jan. 24, 1919, by the Director General of Railroads to the Congress an estimate for an additional appropriation in the sum of $750,000,000. This appropriation was passed by the House, but failed to pass the Senate.

"During the pendency of the estimate the slender resources of the Administration were husbanded to the last degree, with the necessary result of the postponement of payment of many bills due, and with payment to the roads of only such sums as might be necessary to enable them to meet their necessary fixed charges, etc. Calls upon the Federal treasurers were made for surplus funds in their hands, and during the month of January nearly $14,000,000 was thus placed to the credit of the central treasury. Calls were made on various carrier companies to whom money had been loaned to repay such loans, and during the months loans were repaid by some of those corporations amounting to $57,000,000 in round figures of principal, and $393,000 of interest. The total of these various sums

for that month amounted to $81,835,000, that was placed in the central treasury, and in February from various sources $31,300,000 additional was obtained.

"During the months of January and February, however, expenditures in the way of compensation and loans of carriers were made amounting to $89,930,000, and moneys were advanced to Federal treasurers to enable them to take care of vouchers and other pressing obligations amounting to some $36,139,000, while manufacturers of locomotives and cars were paid on account of indebtedness to them sums aggregating $48,125,000, and there were other payments amounting to $2,340,000. The result was that the balance in the central treasury amounting to $78,188,531 was reduced at the end of February to $14,795,894, and it was estimated that the Federal treasurers had on hand outstanding vouchers and payroll checks aggregating approximately $258,000,000, and they had cash on hand to pay them amounting to only about $129,500,000.

"The failure of the appropriation asked for presented, therefore, a very acute situation and required drastic steps to be taken. One of the first methods adopted was to get the War Department to pay to the Railroad Administration $100,000,000 on account of services performed by the Railroad Administration for the War Department, but which had not been vouchered. It was perfectly apparent that there was at least $100,000,000 of indebtedness from the War Department to the Railroad Administration, and in order to relieve the latter of the embarrassing situation which confronted it, without waiting for the vouchers to come in due course, the War Department paid on account the sum stated. Subsequently, as the vouchers came in and were audited, the War Department took and was given credit on account of the sum thus advanced; $10,000,000 was obtained from the Navy Department; $50,000,000 was borrowed from the War Finance Corporation.

Certificates of Indebtedness Issued

"By these methods a total of $160,000,000 was added to the $14,500,000 that still remained in the central treasury. The money thus obtained in these various ways did not, however, provide anything like enough money to take care of the demands that were being made by the various railway companies for advances to them on account of compensation in order that they might in turn pay their corporate expenses, fixed charges, taxes and in certain instances their dividends. Conferences were had with them and it was agreed that as the Railroad Administration was unable to pay them on account of compensation due in cash, it would issue to them certificates of indebtedness in amount sufficient to enable them to obtain the money so needed and only in such amount.

"Conferences also were had with prominent bankers over the country and with the War Finance Corporation to the end that the banks and the War Finance Corporation might come to the help of the companies by loaning them money upon their obligations with these certificates as collateral. Under this plan there was issued to the carrier companies in March $47,842,500 worth of such certificates; in April $79,517,300 worth; in May $57,831,500 worth, and in June $8,081,675, making a total of $192,272,975 worth of certificates of the Railroad Administration.

"During the summer and early fall the earnings of the roads sufficiently improved to warrant the hope that no further deficits would be incurred, but the situation that looked so very promising in August and September shortly thereafter was greatly affected by virtue of two chief factors, one of which had an indirect effect, and the other a very direct effect. The steel strike affected the earnings of the Railroad Administration by slackening business. The uncertainty that existed in the country as to what might be the developments growing out of it served to affect traffic which was immediately reflected in the earnings of the roads. The coal strike had a very direct effect in this regard, as well as increasing greatly the cost of operation during the remainder of Federal control.

"Earnings fell off very materially and the deficit in operation from month to month grew in volume. The estimate of $1,200,000,000 which was presented to Congress in May, 1919, though predicated upon the belief that there would be no further deficit incurred through operation of the railroads, as previously stated, was not allowed in its entirety, and the $750,000,000 that Congress voted, together with the reduced earnings from operations, resulted in the Railroad Administration's being at all times restricted in the amount of moneys available for capital expenditures, for the payment of its operating obligations and compensation to the carriers.

Congress Appropriates Less Than Estimate

"Upon the convening of Congress in an extraordinary session, estimate was submitted for $1,200,000,000 in order to enable the Railroad Administration not only to redeem the certificates of indebtedness that it had issued, but to enable it to pay promptly all past due indebtedness on account of compensation, all outstanding vouchers and to have available sufficient working capital to enable it to efficiently and economically administer its affairs. Estimate was submitted upon May 24, 1919, and Congress promptly considered the same. but appropriated the sum of $750,000,000 in lieu of the $1,200,000,000 asked for. The bill was signed by the President upon June 30, and immediately steps were taken to call in and pay outstanding certificates of indebtedness. Through the generous and active co-operation of the Treasury Department and the Federal Reserve banks arrangements were made for presentation of these certificates at and payment by any Federal Reserve bank on July 15, and on that day out of a total of $285,308,172.26 face value of certificates outstanding there was paid $245,938,808 worth, and this without appreciable disturbance of money balances in any part of the country.

"The failure of the Congress to appropriate moneys requested in the latter part of January, 1919, prevented any large undertakings in the way of additions and betterments during the first quarter of the year and the reduction by $450,000,000 of the amount requested of the Congress at the special session, with the limited funds being received from operations, together with almost complete inability of the carriers to pay for any additions and betterments, made necessary the elimination of all projects for capital expenditures not of the most necessary and pressing character. The details of such expenditures are set out in his report. Exclusive of allocated equipment, such expenditures for the year 1919 and January and February, 1920, amounted to a total of approximately $419,821,000.

"In 1918 there was ordered 100,000 freight cars and

1,330 locomotives, and in the early part of 1919 there was an additional order of 600 locomotives, the estimated cost of all of the equipment being $402,000,000. This equipment was allocated from time to time to various railroads according to the estimate of their need for such equipment. While some of the roads early accepted the allocation of this equipment, many very strongly protested against the allocation. They based their objections on two grounds—one was that the cost was excessive and represented a war cost that the Government should bear, and the other was that they did not need the equipment that was being purchased; and some roads protested that they did not need the type that had been ordered.

"The Railroad Administration insisted that the cost was not excessive and that the quantities ordered were, if anything, inadequate to the need and that it was the duty of the railroads to supply themselves with the equipment necessary to perform their services as public carriers. Unfortunately, these views were accepted by only a limited number of the railroads in the first instance, and it was not until late in the year 1919, and after arrangements had been made for the carrying by the Government for the carriers of the cost of the equipment, that all of the equipment was accepted by the roads.

New Equipment Expected To Be Costly

"In view of the fact that it is now plainly patent that similar equipment will cost at least as much as this equipment has, and that the roads are badly in need of considerably more locomotives and cars, it may not be amiss to recite the conditions that confronted the Railroad Administration in connection with the acceptance of this equipment and which conditions, together with the limited funds at its disposal, prevented the Railroad Administration from undertaking the procurement of additional equipment although fully alive to the conditions that were confronting the railroads and the country as a result of the scarcity of locomotives and cars.

"On April 7, 1919, there had been accepted, 46,800 cars; there were allocated and not accepted 47,950, and there were unallocated 5,250; on May 9 there had been accepted 48,800; on June 11, 48,300; on July 14, 54,750; on August 7, 62,350; on September 9, 66,350; on October 8, 68,300; on November 12, 73,600; on December 10, 83,800. In January there were accepted 94,850; on February 9, 99,000, and by March 1 all of them had been accepted.

"Of the locomotives, it is the same story; accepted in April, 891; in May, 913; in June, 997; in July, 1,345; in August, 1,390; in September 1,564; in October, 1,709; in November, 1,740; in December, 1,869; and so on down to a final acceptance of all of them.

"The amount of compensation accruing monthly to the carriers for their properties under Federal control approximates $75,000,000. With the exception of four months—July, August, September and October—the net operating income from month to month was much less than this sum, and with the need to pay the cost of current additions and betterments as well as take care of those coming over from the previous year, it was necessary at all times to husband the moneys of the Railroad Administration. The carriers have been paid the sums necessary to enable them with their other resources to meet the corporate needs and fixed charges specified in the contract as above set out and dividends where the financial strength of the road warranted, but payments have practically been confined to such needs in the case of all carriers.

"As a result as to some few of the stronger roads whose standard compensation with other resources are considerably in excess of their fixed charges and dividends and for whom addition and betterment expenditures have been light the Director General is in debt over and beyond any indebtedness of such roads to him. As to the great majority of the roads, however, notwithstanding the conservation policy pursued as to compensation payments to them, they on a complete settling up of accounts, are indebted to the Government. From June 1, 1919, to the end of Federal control on March 1, 1920, there was paid, on account of compensation, to the carriers the sum of $776,825,760.71, the amount so paid being about equal to the compensation accruing for the same period."

Mr. Sherley describes in detail the arrangement made under which railroad corporations which are not in a position to pay cash for allocated equipment may meet such obligations with equipment trust notes. The total of such notes will amount to not more than $374,647,756 nor less than $345,875,352, according as the actual cost of the equipment may finally be determined.

The report outlines the reorganization of the Boston & Maine R.R., tells how the Government apparently has saved several millions of dollars by assuming its own fire risk, with the exception of marine property, and summarizes the provisions of the Transportation Act of 1920 under which funds are provided for liquidation of the Railroad Administration and winding up of questions growing out of Federal control.

Illinois Law-Makes Provision for Mine Surface Support

UNDER the law of Illinois, as by the general common law, where underlying minerals are conveyed, the grantor retaining the surface, he has a clear right to have the surface supported in the removal of the minerals. This right of support, being vital to the owner of the surface, is not presumed to have been given up by a conveyance of mining rights, in the absence of some express or strongly implied waiver on his part.

"The word 'surface' in mining controversies means that part of the earth or geologic section lying over the minerals in question, unless the contract or conveyance otherwise defines it. It is not merely the top of the glacial drift, soil, or the agricultural surface." A clause in a conveyance of coal mining rights excepting from the grant of underlying coal that lying beneath that portion of the surface occupied by buildings does not warrant an inference that it was mutually understood that the grantee of mining rights was under no obligation to support the remainder of the surface.

"A clause providing for removal of the underlying coal 'without entering upon or injuring the surface,'" etc., requires the mining to be so carried on as not to let down the surface. Injunction lies at the instance of the owner of a stratum of limestone which he is mining to restrain the owner of underlying coal mining rights from letting down the surface to the former's damage. *(United States District Court, Northern District of Illinois; Marquette Cement Mining Co. vs. Oglesby Coal Co.; 253 Federal Reporter, 107.)*

To Merge Forty Coal Mining Companies In Illinois Standard Field

ANOTHER attempt to merge the ownership of forty coal mining companies operating in the Standard Illinois fields, operating in the inner group of coal mines in Central Illinois, is being made by St. Louis and New York capitalists. The merger will involve a consideration of between $8,000,000 and $10,000,000.

The purpose of syndicating the ownership of the mines, according to those interested, is to increase, not limit, production; to eliminate trade abuses and to stabilize prices. By limiting production the purpose of the amalgamation would be defeated, those interested in the new organization say. It has been said that a number of large coal operators have been solicited to pool their interests, but those concerned said their plans were not complete and that information of the details of the merger would be announced later.

Louis J. Nicolaus, vice-president of the Straus-Nicolaus Investment Co., said that his company was interested in the deal in conjunction with New York interests. He said options had been obtained on about 40 per cent of the mines in the Standard field. These mines produce about 15 per cent of the total coal mined in that section. The daily production of the inner mine group is about 50,000 tons, most of which is sold through St. Louis. About half of the coal produced in the Standard field is sold to St. Louis.

The details of the merger are to be completed in July. The options which have been obtained will expire within thirty days. This is the fourth large merger of Illinois coal interests which has been proposed during the last twenty years. All three previous ones have failed.

Because of the conditions beyond the control of operators, the marketing of coal through the St. Louis gateway presents difficult problems to such an organization. The method used in selling the product of such a number of mines by a single organization is an extremely intricate one. It is because of these difficulties in adopting an efficient system of distribution that the failure of the other mergers resulted. The largest of these proposed mergers was launched just prior to the panic of 1907. It failed when it had been under way only a short time.

The new consolidation would give the purchasing syndicate control of most coal mines adjacent to the Illinois Central R. R., all Illinois mines on the Louisville and Nashville, the Baltimore and Ohio, East St. Louis and Suburban lines and mines on many other roads. The O'Fallon, Suburban, Troy and Eastern and Litchfield and Madison systems are the only roads on which mines in the Standard field would not be affected by the merger.

The Illinois Central mines, the output of many of which is consumed entirely by the road itself, extend forty miles east of East St. Louis. The elimination of competition in the Standard field, which will result from the merger, will place the entire coal output in the St. Louis district in the hands of a few operators. The other Illinois fields, which produce a better grade of coal than the inner group in the Standard field, also are controlled by a few operators. The Carterville field, in southern Illinois, is controlled by an association, and the Mount Olive field, adjoining the standard, is controlled by two or three operators.

The merger is expected to eliminate the selling of coal at lower rates in the summer months and to regulate the price of coal so as to have a uniform scale for both summer and winter. Consumers are now paying about 25 cents a ton below the normal price when they purchase in the summer and about 50 cents a ton higher than normal when they buy in the winter.

Text of Seasonal Rate Bill

THE text of the bill providing for seasonal coal freight rates which appears as an amendment to the Interstate Commerce Act, as reported by Senator Frelinghuysen on behalf of the sub-committee to the full committee of the Interstate Commerce Committee of the Senate, is as follows:

"That section 15 of the Interstate Commerce Act, as amended, is hereby further amended by inserting after paragraph (6) thereof a new paragraph to read as follows:

"'(6a) When used in this paragraph, the term "coal" includes anthracite and bituminous coal, lignite, coke, including petroleum coke, and briquets and boulets made from anthracite and bituminous coal and from coke. From and after thirty days immediately following the enactment of this amendment, no carrier by railroad subject to this act shall demand, collect, receive or enforce, for the carriage of coal, any individual, proportional or joint rate which is greater or less than—

"'(a) 5 cents per ton more than the schedule base rate then in effect therefor for shipments made during August,

"'(b) 15 cents per ton more than such rate for shipments made during September,

"'(c) 25 cents per ton more than such rate for shipments made during October, November and December, or

"'(d) 10 cents per ton more than such rate for shipments made during January, or which is greater or less than

"'(e) 10 cents per ton less than the schedule base rate then in effect therefor for shipments made during February,

"'(f) 25 cents per ton less than such rate for shipments made during March, April and May,

"'(g) 15 cents per ton less than such rate for shipments made during June, or

"'(h) 5 cents per ton less than such rate for shipments made during July.

"'Whenever, after full hearing upon complaint or upon its own initiative, the commission is of the opinion that any such individual, proportional or joint rate as so reduced or increased is or will be unjust or unreasonable or unjustly discriminatory or unduly preferential or prejudical, the commission is hereby authorized and empowered to determine and prescribe what will be the just and reasonable individual, proportional or joint rate to be thereafter observed during the months to which the proceeding relates, and to make an order that each carrier affected shall cease and desist from demanding, collecting, receiving or enforcing a different rate than that so prescribed for the carriage in question.

"'Whenever, after full hearing upon complaint or upon its own initiative, the commission is of the opinion that any of the increases or deductions in rates for the carriage of coal, as prescribed by this paragraph, or by order of the commission hereunder, cause or will cause shipments of coal to be made in such disproportionately large or small quantites during the months in question

as to prevent the carriers affected from handling their traffic properly, from using their equipment and facilities most uniformly and efficiently, or from receiving just and reasonable revenue from such coal traffic as a whole, the commission is hereby authorized and empowered to determine and prescribe what increases or deductions in rates for the carriage of coal above and below the schedule base rates in effect therefor for the carriers affected and for the months in question will be just and proper, to be thereafter observed, and to make an order that each carrier affected shall cease and desist from demanding, collecting, receiving or enforcing a different rate than that fixed in conformity with the increases and deductions in schedule base rates so prescribed for the carriage of coal.

PROVISIONS TO PREVENT DISCRIMINATION

"'Nothing contained in this paragraph shall be construed to authorize or require any carrier to demand, collect, receive or enforce (a) any rate which is less than its schedule base rate for the carriage of coal which has already been carried by it, or by any other carrier, under a rate as reduced under the provisions of this paragraph or by order of the commission hereunder, unless a carriage by water has immediately preceded such subsequent carriage by rail, or (b) any charge which is greater or less than that shown in its schedules for switching and other incidental services performed in connection with the carriage of coal, or (c) any rate which is greater or less than its schedule base rate for the carriage of coal, when such schedule base rate is 75c. or less per ton for the carriage in question. For the purposes of this act the schedule rate for the carriage of coal, except as otherwise provided herein, shall be considered to mean the schedule rate therefor as increased or reduced under the provisions of this paragraph or by order of the commission hereunder.'"

Amend the title so as to read: "A bill to further amend the Interstate Commerce Act, as amended, to provide for seasonal rates for the transportation of coal."

Cushing Attributes Traffic Congestion To Lack of Locomotives

IN connection with the efforts of the Interstate Commerce Commission to relieve traffic congestion, George H. Cushing has submitted a statement authorized by the American Wholesale Coal Association. In that statement he points out that there are three causes for the predicament in which the railroads find themselves. A portion of his statement is as follows:

"1. Unwillingness to work shown by the railroad employees.

"2. That the railways have fewer cars than necessary.

"3. That the railways have fewer locomotives than are needed to move trains, or have not properly distributed their locomotives.

"The railway employees will disclaim responsibility for the failure of transportation. Their statement is too hard to prove or disprove for the question to command serious consideration at this time.

"Whether or not we have enough cars cannot be proved until we have the maximum daily movement of cars in service, and that admittedly we are not getting today. In fact, the movement per day is decreasing rather than increasing.

"This analysis seems to put emphasis upon locomotives rather than upon cars and men. We believe that is where the emphasis should properly be placed.

"Our recommendation is that since the congestions which are killing cars and transportation capacity are in class 1 and 2 cities and since congestion always is an index of a shortage of motive power, it should be recommended to the railways that they subtract from engines employed in cross-country hauls to switch the terminals in class 1 and 2 cities. This means that we believe more emphasis should be placed upon engines in switching service than engines in cross-country hauls, because it only adds to confusion if you ship commodities to terminals but lack the motive power in terminals to do the switching.

"If by this simple change you avoid congestion, you will increase the mobility of cars and very soon determine whether you have enough engines on the railroads. If you have not, then the simple answer to the traffic question is to get more engines. At least a different distribution of motive power would serve to fix the responsibility and to localize the trouble."

House Committee Favors Byproduct Coke Ovens

MANUFACTURE of ammonium sulphate at the government plant at Muscle Shoals in relation to the byproduct coke industry is discussed in the majority report of a House committee which is investigating war expenditures. The committee says:

"During the war the War Department, through a large expenditure of public funds—amounting to many millions—by loans, contracts for the products and by building, caused the erection of approximately 1,500 byproduct coke ovens. There are now in operation in the United States about 11,000 of these byproduct coke ovens engaged primarily in the manufacture of coke and producing as one byproduct approximately 500,000 tons of ammonium sulphate during the present year. The ammonium sulphate produced by these byproduct coke ovens is largely in excess of any amount of ammonium sulphate ever used heretofore in the United States for agricultural purposes.

"The committee finds that no better single method of conservation of our national resources can be adopted than to encourage the supplanting of beehive coke ovens by coke ovens of byproduct type to that point where all coal carbonized for coke shall be so carbonized in ovens that will conserve the immensely valuable byproducts of the coal, now permitted in large degree to waste in the atmosphere. The building of such byproduct ovens is encouraged and stimulated by the prospect of a reasonable selling price for their byproducts, one of which is ammonium sulphate, an excellent nitrogen fertilizer material, and another toluol, a motor fuel of great excellence.

"If the War Department, or some agency of the Government acting under or through the War Department, should engage in the manufacture of ammonium sulphate for commercial purposes at Muscle Shoals in competition with private industry, it would have a decided tendency to retard the future conversion of cheap beehive coke ovens into the more expensive but vastly more efficient and conserving byproduct ovens."

Discussion by Readers

Edited by
James T. Beard

Co-operation of a Kind That Spells Success

REFERRING to the question of co-operation among mine officials, to my mind, John E. Ambrose has summed up, in a few words, the real object and purpose of such co-operation, when he says it is "to bring about greater efficiency in coal-mining operations, through more social relations whereby a better understanding will be established between employers and employees, on what may be termed a brotherhood in which men will have and take a deeper interest in each other's welfare." *Coal Age*, April 1, p. 662.

In my opinion, there can be no question but that a brotherhood of miners and operators, based on co-operative principles, would have a strong tendency to bring them close together. By this means, the operator would become more interested in the social, sanitary and financial welfare of his employee, and the latter would take a greater interest in the financial success of his employer. The successful operation of the mine would then be shared, in common, by both. The interest of one would become alike the interest of the other.

Co-operation Means Working Together for the Common Interests of All

Co-operation is the foundation principle on which labor and capital will be best able to adjust all their real differences. When capital and labor meet each other in a co-operative spirit and adopt the Golden Rule as a standard, all their differences will cease to exist. It is a regrettable fact that far too many employees take little or no interest in the success of their employer's business. Seemingly, many would rather see their employer fail than to see him prosper. I have known men to work for the same company for years and receive good wages, but never speak a favorable word for the company who employed them. Instead they were most always ready to say something against the company.

Co-operation of mine officials and mine workers may well be defined as a working together for the common interest and success of the undertaking, from the general manager down to the boss driver. They should all have the same object in view; namely, the successful operation of the plant. I am sorry to say, some high officials become selfish and autocratic in their official relation to their subordinates. By that means they hinder or destroy the spirit of co-operation, instead of fostering it as they should.

As has been stated, a mine official may be well prepared to fill the position he is holding, from the standpoint of his experience and knowledge; but, because of his selfish disposition and the lack of a spirit of co-operation with his brother officials, he may prove a complete failure. Again, there is a kind of selfish co-operation that is manifested only when greater benefits are to be received than those given. Co-operation, to be effective and beneficial, must be mutual.

In my opinion, instances are numerous where companies have suffered financial loss for want of better co-operation on the part of some of its officials. As an illustration of this fact, I will cite an instance that came under my own observation at a mine where I was employed. In some way the superintendent of the mine and the railroad officials handling the cars for that mine were at outs with each other.

It will cause no wonder that, as a result, the mines were frequently idle for an hour or so during the day, on account of the railway officials not shifting the cars when they knew that they were loaded. In this case, it was not the mine official who suffered the financial loss, but the company who owned both the mine and the railway. One official of the same company cannot work long against the interest of another official, without doing an injury to the interest of the company.

In conclusion, permit me to say that I do not much favor the plan or idea of a state and Federal board, suggested by J. A. Richards, on page 661 of the same issue, requiring the submission of plans of proposed mines before they are opened. In my opinion, such a system would involve much red tape, cause many needless delays and could not be applied to all coal seams. In uniform seams, prearranged plans might be feasible; but, owing to the geological formation of many irregular coal seams, such a plan would not be practical. An instance of this is the Nelson seam, located deep down under Walden's Ridge, in this state. This seam cannot well be operated on any prearranged plan or method, but the plan must await the development. The geological conditions will determine the method of operation in that case, as the development proceeds.

JOHN ROSE.
Dayton, Tenn. Former District Mine Inspector.

Can Coal Be Cleaned By Flotation?

REVIEWING the article presented under this caption, *Coal Age*, April 22, p. 795, prompts me to venture some personal views regarding this particular method of improving the quality of coal for shipment. In direct answer to the question, preliminary experiments made indicate that bituminous coal under this treatment will show favorable reductions of ash, sulphur and other impurities, but when the same treatment is applied to anthracite, more particularly to culm product, the results obtained are negative.

The procedure in floating coal, as compared with floating mineral substances, is a reversed one. For example, when treating 2,000 lb. of mineral, an average of 200 or 300 lb. of concentrates is raised by the froth, leaving, say 1,700 lb. of tailings to go to the bottom of the machine. But, in the case of the treatment of coal, 1,700 lb. has to be raised by the froth, and 300 lb. remains at the bottom as tailings or refuse.

It is therefore evident that, since the air bubbles in the flotation machine furnish the actual lifting medium and lift the material several feet high, it is necessary to supply a comparatively large volume of air. For this reason, it is plausible to assume that a pneumatic type of machine would be better suited for the treatment of coal than is the agitator type, considering the cheaper operating costs of the former machine.

Coal to be treated by the flotation principle would, necessarily, have to be finely ground, and it is doubtful if coal coarser than what will pass through a 30-mesh sieve can be raised by the ordinary frothing medium. As to the amounts of the reagents necessary for this treatment, much will depend on the re-use of circuit waters in the system. Then, there is the air consumption required, so much per ton of coal, which estimate is not available. Moreover, the dewatering of the treated product, of this fineness, would present no little problem, as all coal workers are familiar with the difficulties in handling coal of this state and fineness.

The use of proper frothing reagents and their presence in the finished product (even in small quantity) and their effect on the apparatus must also be studied and carefully considered. Experimental work, so far, with the flotation method, does not show a more efficient extraction of the impurities than the present perfected types of gravity separation. There are possibilities, however, in its application and the technicians in this particular field should give the matter its fair share of consideration and study. A time will come when portions of our coal will have to be treated by other methods than the straight, water-gravity type.

———, Ill. BYKEM.

Working Kanawha River Coal

HAVING read the request of Arthur L. Sheldon asking for suggestions in regard to the best plan for working three overlying seams of coal, and having had considerable experience in the working of contiguous seams, I venture to give an opinion on the matter.

First, regarding the relative advantages and disadvantages of shafts and slopes, in the operation of these seams, I am in favor of a slope opening.

A shaft, to give an output of one thousand tons a day, would require the installation of a fairly large and powerful first-motion hoisting engine and this in turn would require a correspondingly large boiler plant. Also, to use a hoisting tank having a capacity of from five to ten tons, would require an engine capable of handling this output in a comparatively small part of the working day, since the tank system is of advantage only when a tank of large capacity is used and the output is sufficiently large to justify a high-powered hoisting equipment.

The belt or conveyor system mentioned might suit for the top seam if that seam was to be worked alone but I would not advise depending on a conveyor to handle an output from a depth of 160 ft. As previously stated, I would prefer a slope opening and this should have a dip of from 15 to 20 deg. I would lay two tracks so that the descending empty trip would help to balance the ascending loaded trip. This would greatly reduce the power required for hoisting and call for an economical power plant.

Another important advantage of a slope opening is that the men will not require to be hoisted, which makes for greater safety and the saving of time. The weighing of the coal underground should be considered only in the event of arrangements being made to empty the cars on top without uncoupling them or detaching them from the haulage rope, as is being done at several mines where the whole trip is hauled onto a rotary dumper and dumped in one operation.

This property is mentioned as being below the level of the Kanawha River, and I would consider it unsafe to work the coal under the river, with but 50 ft. of cover; although the lower seam could be worked and sufficient pillars left to support the roof, under the river, and, say for 200 ft. on either side. But the top and center seams I certainly would not work beneath the river, except for the purpose of driving narrow roads through to connect with any property that may be on the other side.

WORKING FOR A MAXIMUM RECOVERY OF COAL

Assuming that the maximum recovery of coal from all three seams is an essential factor in this operation, my plan of proceeding would be as follows: The required output of one thousand tons can be obtained, with but a few months' development, from the lower seam, which is from 6 to 9 ft. thick. I would work this seam on the pillar-and-stall plan, but would not take out any of the pillars, until the boundary was reached. My reason is that to take out the pillars from a seam 9 ft. thick, the subsequent caving would damage the center seam, which is only 60 ft. above. The amount of damage will vary according to the nature of the strata separating the seams, and may be anything from a little inconvenience to absolute ruin.

While the required output is being secured from the operation of the lower seam, I would start work in the center seam. This seam, being from 3 to 5 ft. thick, it would be very suitable to use the longwall system. If the seam is worked before the pillars are taken out in the seam below, it should make an ideal seam in which to employ some type of longwall cutting machine.

However, I would not start longwall operations at first; but would drive a three- or five-entry system toward the boundary. When that was reached I would open out on the longwall system. The coal, being from 3 to 5 ft. thick, would require the roof to be ripped on the roadways and this rock, together with the débris from the ordinary working of the seam, would serve to build packwalls for the support of the roof.

IMPORTANCE OF WELL BUILT PACKS

Well built packs will reduce the settlement of the strata so that the top seam, which is 50 ft. above, will not be damaged. The work in the center seam should be driven faster than that in the bottom seam, so that by the time the bottom seam reaches the boundary the coal will have been worked out from the center seam in that area.

The top seam can probably be worked from the haulage roads of the middle seam, by means of several rock drifts driven up from the center seam. This appeals to me as a more economical method of working the top seam than by driving a separate haulage system for the top seam alone, especially as the required aggregate output from all the seams is only one thousand tons.

I would work the top seam also by the longwall method, whether it is worked in conjunction with the center seam or by itself. The effect in the bottom

seam would not be sufficient to do any damage to the top seam, as they are 160 ft. apart and, in addition, the working of the center seam will act to distribute these effects.

In working the center seam it may not be necessary to reach the boundary before starting the longwall work; but that should not hinder the progress toward the boundary. The pillars in the bottom seam, under those areas where the coal has been worked in the center seam, will be available for any emergency; but, unless such conditions arose, I would go right to the boundary, before pulling the pillars.

No mention is made of the extent of this property. If it is extensive the operations should be carried forward in several directions, at the same time; and if the boundaries are a great distance from the outlet it will be best to arrange for a main haulage system that will concentrate the output of all three seams. The best seam in which to carry this main haulage can only be determined by local conditions, such as the position of the face line in the different seams, and the nature of the roof strata. These have an important bearing on the expense of maintaining permanent haulage roads. The lower seam, having 30 ft. of sandrock for a roof, should give an opportunity to drive haulage roads that would last during the life of the mine, providing sufficiently large pillars are left to support the roof and prevent the occurrence of a squeeze.

The question of drainage has an important bearing, especially on the top seam. If there is any probability of this seam letting surface water into the mine, it may be best to leave it, until the other two seams are worked out. However, no mention is made of this factor. JAMES DICKSON.

Victoria, B. C., Canada.

Barometer re Depth of Shaft

SOMETIME ago I remember seeing a question answered in *Coal Age*, regarding the increase in barometric pressure, in a shaft 1,100 ft. deep, with an initial pressure of 30.2 in. of mercury, at the top of the shaft, and temperatures of 64 and 75 deg. F. at the top and bottom, respectively. Being busy at the time, I merely noticed that the answer given, namely, 2.8 in. seemed somewhat higher than I had ever observed in practice. A further mention of it, in a recent issue of *Coal Age*, again brought it to my attention and I started to calculate what change of pressure would result by reason of the depth of the shaft and the increase in temperature.

As a rough check on the given figure, I think no one will deny that the densest air will be found at the bottom. Then, if the estimated increase (2.8 in.) is correct, the barometric reading at the shaft bottom would be 30.2 + 2.8 = 33 in.; and the weight of a column of air a foot high and 1 sq.in. in section would be (bar. 33 in., temp. 75 deg.)

$$\frac{1.3273 \times 33}{144\ (460 + 75)} = 0.00056855\ lb.$$

Now, even assuming this maximum density held all the way up the shaft, which we know is not the case, the increase in barometric pressure due to a depth of 1,100 ft. would only be

$$\frac{1{,}100 \times 0.00056855}{0.491} = 1.27\ in.$$

Having gone this far, I proceeded to work out the following solution, and would appreciate the opinion of *Coal Age* as to its being correct:

Let p = Pressure (lb. per sq.in.);

x = Distance from top of shaft (ft.).

Then, since the temperature increases 1 deg. each 100 ft. of depth; or 0.01 deg. per foot of depth, we have for the increment of pressure,

$$\delta p = \frac{2.7\ p}{144\ (524 + 0.001x)}\ \delta x;\ \text{or}$$

$$\frac{\delta p}{p} = 2.7\ \frac{\delta x}{75{,}456 + 1.44x}$$

Integrating the last expression, we have,

$$\log Cp = \frac{2.7}{1.44} \log.\ (75{,}456 + 1.44\,x)$$

Knowing the value of p when $x = 0$, we can determine the value of C, the constant of integration, in this case; thus,

$$p_0 = \frac{30.2}{29.921}\ 14.697 = 14.834\ \textit{lbs. per sq. in.}$$

Then,

$$\log C = \frac{2.7}{1.44} \log 75{,}456 - \log 14.834$$

$$= 9.1456759 - 1.1712583 = 7.9744176$$

To determine the value of p_{1100}, at the bottom of the shaft, make $x = 1{,}100$, and 1.44 x = 1.44 × 1,100 = 1,584, which gives,

$$\log p = \frac{2.7}{1.44} \log\ (75{,}456 + 1{,}584) - 7.9744176$$

$$= 9.1625931 - 7.9744176$$

$$= 1.1881755$$

Hence,

$$p = 15.423\ \textit{lb. per sq.in.}$$

The increase in pressure is therefore 15.423 — 14.834 = 0.589 lb. per sq.in., which is equivalent to 0.589 ÷ 0.49 = 1.20 in. of mercury. JAMES A. BLOCK.

Welch, W. Va.

[We are glad this correspondent has drawn attention to the error that occurred, inadvertently, in our reply to the question to which he refers. The method by integration he presents is correct, showing an increase in barometric reading of 1.2 in. for a depth of 1,100 ft., under the given conditions.—EDITOR.]

Reasons Why Shotfirers Should be Employed in Mines

READING the suggestion of a recent writer, in *Coal Age*, who seems to think that the employment of shotfirers in a mine might be considered as harmful or dangerous surprised me greatly. For myself, I would not care to even consider any attempt that had for its object the elimination of shotfirers, whom I regard as important factors in making and keeping mines safe for work. There are several important reasons why shotfirers should be employed in mines where the coal is blasted, and I will mention a few of them.

First, the employment of shotfirers makes it necessary to have always in the mine one experienced and reliable man who is charged with the oversight of from 40 to 50 miners, a comparatively few of whom can be said to be safe workmen if left to follow their own habits and inclinations.

Now, suppose for a moment that there was no shotfirer employed, in order to secure the same degree of safety each of these 40 or 50 men would need to have an equal amount of experience and be equally reliable as the one shotfirer. Even then, the foreman would be obliged to take many chances on the experience and reliability of these men, while the shotfirer's capabilities are well known to him.

Our records show that, among miners, about one man in five is killed by a premature explosion or a misfire, or the careless handling of powder in making up a charge, or other similar cause growing out of his lack of knowledge or skill in the handling of explosives and the shooting of coal. On the other hand, a comparatively few shotfirers are killed; and the most of these are caught by a fall of roof or coal, or die from some similar cause not directly connected with the work of blasting. This fact results not only from their knowledge and experience in the firing of shots, but is due to their constant vigilance and care to detect unsafe conditions, in firing, especially where gas is present.

A Mine Employing Shotfirers Requires to Be Well Ventilated

Second, generally speaking, the employment of shotfirers in a mine insures good ventilation. No trustworthy and reliable shotfirer will fire a shot where conditions would make it unsafe; and the ventilation of places where shots are to be fired is an important factor in respect to safety. I have seen shotfirers refuse to shoot coal, and the miner thought he was being discriminated against until the shotfirer pointed out the danger, after which the miner would apologize for his lack of foresight in placing the hole. It was made clear to him that the firing of the shot would not only have killed the miner and the shotfirer, but have caused the death of others in the mine.

Another feature to be considered is the economy effected by the employment of shotfirers. If I was an operator, I would rather spend $6,000 in the payment of wages to three shotfirers, than to have one miner killed in charging and firing his own holes. My reason is that the payment of wages to live healthy men is better than the payment of compensation to widows and orphans. I am thankful that there are operators who are progressive enough to view the question of employing shotfirers from this standpoint.

Blasting Coal or Rock by the Use of Fuse and Caps Is Unsafe

While we are speaking of blasting coal, there is one practice in particular that should be entirely stopped. In my opinion it is the cause of the death of more miners than any other agency employed in the shooting of coal or rock. I refer to the old fashioned cap and fuse. My preference is to employ nothing but electric caps and a firing battery, for this work, and to use permissible powder. The employment of experienced shotfirers will practically eliminate most or all of the dangerous practices of miners.

As long as we have all classes of miners, speaking different languages, and understanding little regarding the requirements of the mining laws, it would seem that the employment of shotfirers is an absolute necessity. The presence of reliable shotfirers in the mine will give to every mine foreman an added assurance of safety, since he knows it is a common trick of miners to attempt to pull one over on the foreman whenever the miner has the chance. It goes with out saying that any miner will keep his place in better shape, owing to the more frequent inspection by the foreman, assistant foreman and shotfirer, than when there is no shotfirer making his rounds.

It is my conviction that there should be shotfirers employed in more mines than is the case today. To my mind, they are as important to the safe operation of a mine as the mine foreman himself. As well might the latter be eliminated, as to throw out the shotfirer. The work of the latter concerns the most dangerous conditions that exist in coal mining. F. W. S.

Johnstown, Pa.

What the Employment of Shotfirers Has Accomplished

SOMEONE has been asked the question, "Are shotfirers harmful?" This seems an idle question in view of all the shotfirer has accomplished in reducing the number of accidents and making the mining of coal safer and more efficient. My answer to such a question is that, if crime could be legalized, then might we be able to consider the work of the shotfirer as harmful; because then his employment would interfere with practices that are now crimes and make the perpetrators punishable by law.

In my opinion, where a shotfirer complies with the requirements of the mining law, I can see no grounds for thinking that his work can be harmful in any respect. To my mind, such a suggestion appears to be the height of folly and must have come from someone having no practical experience.

Let us look, for a moment, at what the efficient shotfirer has accomplished and what dangerous practices his employment in a mine has eliminated. Even a madman, it cannot be assumed, would be willing to take the chances of again reverting to the custom of a few years ago, when miners fired their own shots when and where they pleased. Such a practice would be far more dangerous today than formerly, because a large majority of the men now employed are not experienced miners.

For this reason alone, the employment of shotfirers is a means of greatly reducing the chances of mine fires and gas and dust explosions. It can be truthfully said that the work of the shotfirer has preserved the lives of a large number of miners and there is but one answer to the question, Is the shotfirer harmful? The only way in which a shotfirer can be harmful concerns himself. In his haste or disregard of necessary precautions, he may make his work dangerous; whereas, with good judgment and skill, he can render his vocation reasonably safe. His own safety rests largely with himself.

Another thing that has increased the safety of mining coal where blasting must be performed is the advent of permissible explosives. One has only to look back to the time when black powder was universally used for blasting coal in mines. The miner would drill a hole, often on the solid, and charge and fire it with squib or fuse taking many chances with an overcharge of powder, a tight shot, short fuse and other practices that endangered not only his own life but the lives of all in the mine. The rules regulating the use of permissible powders have greatly reduced accidents by eliminating many of these chances, but the shotfirer has accomplished even more. Surely, no man with common intelligence would say that his work is harmful.

Perryoplis, Pa. R. W. Lightburn.

Inquiries of General Interest

Answered by

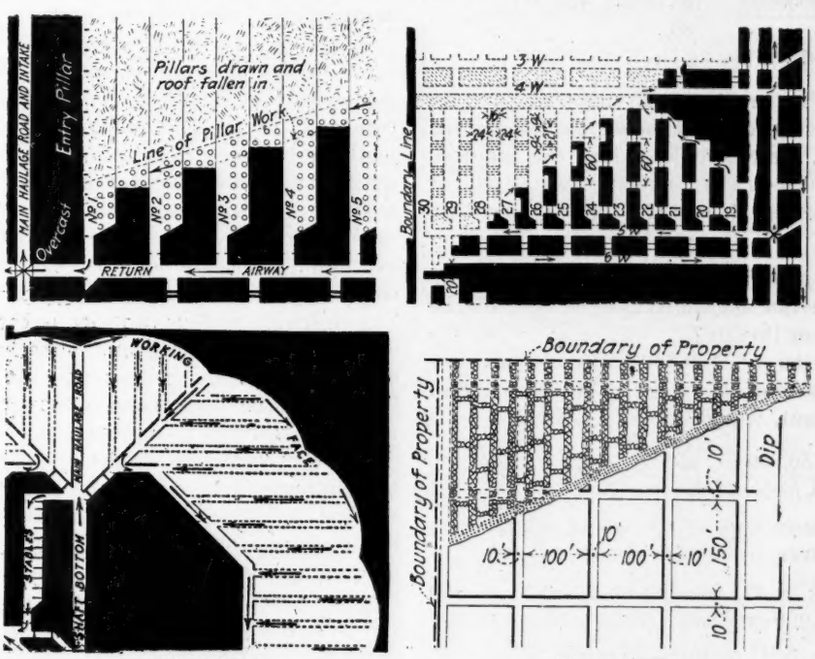
James T. Beard

Room and Pillar Vs. Longwall Advancing and Retreating

KINDLY explain, in *Coal Age*, the advancing and retreating methods of working coal by both the room-and-pillar and the longwall systems, showing their comparative advantages. THOMAS ANDERSON.

Barnesboro, Pa.

In the accompanying figure, are illustrated both the advancing and retreating methods of working, in the room-and-pillar and the longwall systems of mining coal. The two upper sections show the room-and-pillar system and the two lower sections, the longwall system of mining. In each case, the left-hand figure is the advancing method, while the right-hand figure represents the retreating method, in the same system of mining. It will be observed that the general features of the room-and-pillar system of mining consist in driving rooms off the butt heading. The rooms are turned narrow for a short distance, from say 3 to 5 yd., and then widened out to a width of 6 or 8 yd., depending on conditions in the roof and floor of the seam, depth of cover, etc. The narrow portion is called the "neck" of the room.



(Advancing) (Retreating)

ILLUSTRATING THE ROOM-AND-PILLAR AND THE LONGWALL METHODS OF MINING

In the advancing method of room-and-pillar work, the rooms are driven up in regular order, starting from the entry pillar, which is left for the protection of the main haulage road and air-course. The illustration shows the first five rooms as having been driven up, and the work of drawing back the pillars between the rooms as now in progress.

In the retreating method shown on the right, it will be observed that the butt headings have been driven to the boundary line, a distance of about 1,300 ft. from the main heading, which provides for the turning of 30 rooms on 40-ft. centers, and allows for the necessary barrier pillars protecting the main heading. The illustration shows the work of drawing back the pillars between the rooms in progress in rooms 23 to 30, inclusive. Room 22 has reached the limit and the chain pillar at the head of this room has been attacked. The illustration shows rooms 19 to 21 as not yet having reached the limit. There is a break in the figure at this point, the rooms outby from No. 19 not being shown.

In the lower figure on the left is shown a section of a mine worked on the longwall advancing system. As there shown, a solid pillar of coal is left for the protection of the shaft, the main roads being driven through this pillar and the longwall face started by encircling the pillar with an entry. The longwall face is then opened up by extracting the coal forming the outby rib of this entry. As this coal is taken out, packwalls are built and gateroads are maintained by building solid roadside packs. As shown in the figure, diagonal roads are extended at an angle of 45 deg. in each direction from the main road. The gates or gateroads are opened off the diagonal roads, and these gates are cut off from time to time by other diagonals. By means of this system the coal is hauled from every part of the working face to the shaft bottom by the easiest direct route.

In the longwall advancing system, it has been found an advantage in many mining districts to maintain the working face in a series of arcs of circles, as indicated in the figure. By so doing it is frequently the case that the coal breaks better, while the roof pressure is under better control than where the working face is kept in a regular or uniform line. However, where the coal breaks freely, care is required to avoid crushing at exposed points.

To the right of the section just described is shown an outline of the longwall retreating system, the extraction of the coal in this case being made in panels. The work is started at the boundary line and is carried back from the boundary line toward the main heading, the coal in each panel being extracted in turn. As the coal is taken out the roof settles on the waste.

Examination Questions

Answered by

James T. Beard

Mine Managers' Examination Held at Springfield, Ill., Feb. 17, 18, 1920

(Selected Questions)

Ques.—What pressure would be required to produce and maintain an air volume of 150,000 cu. ft. per min., in an airway 8 x 10 ft. and 3,000 ft. long?

Ans.—The rubbing surface of this airway is $2(8 + 10)3{,}000 = 108{,}000$ sq.ft., and the sectional area $8 \times 10 = 80$ sq.ft. The unit pressure producing the circulation of 150,000 cu.ft. per min. is, therefore,

$$p = \frac{k\,s\,q^2}{a^3} = \frac{0.00000002 \times 108{,}000 \times 150{,}000^2}{80^3} = 95 \textit{ lb. per sq.ft.}$$

This pressure is far greater than what is used in mining practice, and the circulation should be divided into two equal splits, which would reduce the required pressure to one-eighth of the amount calculated or $95 \div 8 = 12$ lb. per sq.ft., nearly; or, say a 2¼-in. water gage.

Ques.—In the last question, what would be the total power exerted by the fan engine, if 70 per cent of the power was expended on the air?

Ans.—The circulation of 150,000 cu.ft. of air per minute, under a pressure of 95 lb. per sq.ft., allowing an efficiency of 70 per cent, would be

$$H. = \frac{Q\,p}{K\,33{,}000} = \frac{150{,}000 \times 95}{0.70 \times 33{,}000} = 619 \textit{ hp., nearly.}$$

Circulating this air in two splits, would require but one-eighth of this power, or say 77 hp.

Ques.—With a fan 8 ft. in diameter, making 250 r.p.m. and passing 62,000 cu.ft. of air per minute, under a water gage of 1 in., what is the equivalent orifice?

Ans.—The "equivalent orifice" is a term sometimes used in mine ventilation to indicate the ratio that the quantity of air in circulation (cu.ft. per min.) bears to the square root of the water gage expressed in inches. In this case, the equivalent orifice of the mine is

$$A = \frac{0.0004\,Q}{\sqrt{w.g.}} = \frac{0.0004 \times 62{,}000}{\sqrt{1}} = 24.8 \textit{ sq.ft.}$$

The diameter and speed of the fan does not enter the solution.

Ques.—On going to the mine Tuesday morning, you find the fan making 80 r.p.m., the steam gage shows a pressure of 75 lb., and an air current of 45,000 cu.ft. per min. is passing down the shaft, the water gage showing a reading of 0.4 in. On Wednesday morning, you find the steam gage is 80 lb. the water gage 0.5 in. and the quantity of air passing only 40,000 cu.ft. per min. What would you think was wrong?

Ans.—Both the steam and water gages show an increase, in this case, while the quantity of air in circulation is considerably decreased. It is natural, therefore, to assume that the cause is some obstruction in the mine airways, which increases the mine resistance, thereby reducing the quantity of air in circulation but increasing the water gage, while the power on the air remains unchanged. Under these conditions the speed of the fan will be slightly increased, owing to the fact that less air is flowing through the fan and the power absorbed within the ventilator is less than before, which makes a larger proportion of power available for driving the fan.

Ques.—What gases enter into the composition of firedamp, and in what proportion?

Ans.—The term "firedamp," in American practice, refers to any mixture of gas and air, in inflammable or explosive proportions. It is generally understood as referring to an inflammable or explosive mixture of methane or marsh gas and air. The lower inflammable limit of pure methane and air is reached when the proportion of gas to air is about 1:40, while the mixture becomes explosive when the proportion is 1:13; and the maximum explosive point is reached when there is just sufficient air present to completely burn the methane. The proportion of gas to air is then 1:9.57. The higher explosive limit of this gas is reached when the proportion of gas to air is 1:5; and the higher inflammable limit is attained when the proportion is 1:2.4, assuming normal air and pure methane in each case.

These proportions of gas to air vary somewhat with the character of the gas, the purity of the air and the method of inflammation or the source of ignition, which last concerns the volume and intensity of the flame producing ignition. When a firedamp mixture is ignited by the passage of an electric spark through it the intensity of the initial impulse is much greater than when the ignition is caused by contact with the flame of an open light.

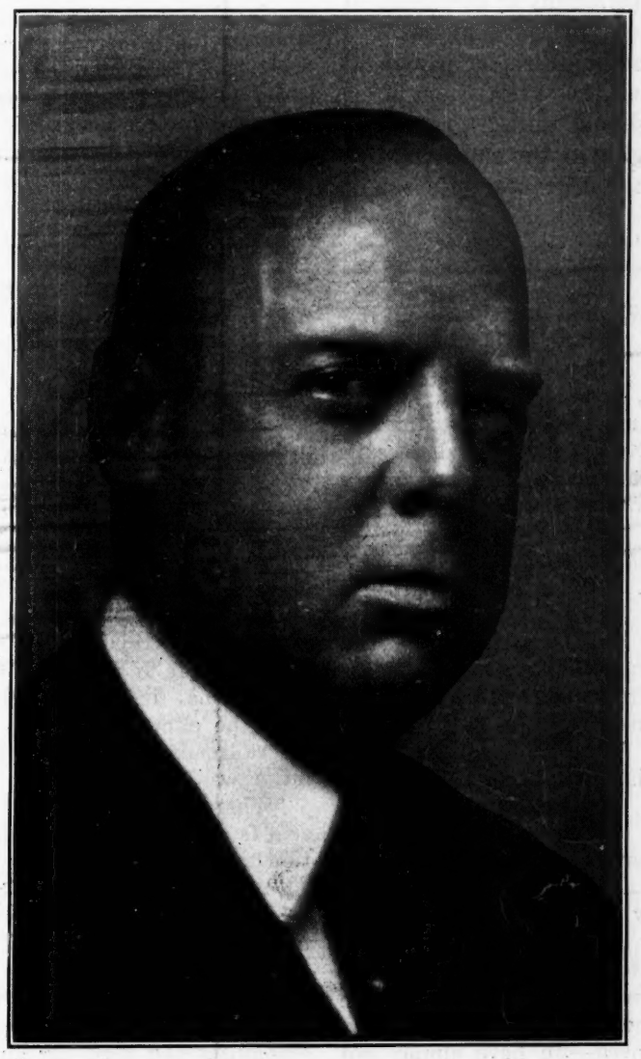
Ques.—We have, in a mine, a sump 62 ft. long, 8 ft. wide and 7 ft. deep; it is full of water. How long will it take a 6-in. pump to empty this sump, the piston speed being 100 ft. per min., the resistance and leakage of valves being 10 per cent? There are 9 two-inch pipes running full of water into the sump, at a velocity of 100 ft. per min.

Ans.—The capacity of this sump is $62 \times 8 \times 7 = 3{,}472$ cu.ft. The piston displacement of a 6-in. pump running at a piston speed of 100 ft. per min. is $100(0.7854 \times 6^2) \div 144 = 19.635$ cu.ft. per min. Assuming a velocity of 100 ft., per min., the water flowing into the sump through 9 two-inch pipes is $9 \times 100(0.7854 \times 2^2) \div 144 = 19.635$ cu.ft. per min. In this case, therefore, since the quantity of water flowing into the sump is equal to the piston displacement of the pump, the pump cannot empty the sump, which will overflow when account is taken of the loss by leakage in the pump.

National Coal Association Holds Convention

Organization at Its Third Annual Meeting at Atlantic City Recounts Progress of the Year and Adopts Helpful Resolutions—Advocates Increased Rates for Railroads and Separate Action on Coal

CONVENED on the playgrounds of Atlantic City, the bituminous coal operators met on May 25, 26 and 27 for serious discussion and frolic. The subjects of serious discussion were relations with the railroads and with the Government, and as the meetings were held only in the mornings, the afternoons and evenings were largely available for pleasure. The size and enthusiasm of the gathering were reduced by the absence of the Indiana delegation, to which Judge Anderson had refused passports for the trip. The first day was devoted to the address of the retiring president, H. N. Taylor, which is printed in full in this issue of *Coal Age*, and to preliminary consideration of reports of various officers and committees. The report of the Railroad Relations Committee on the assigned car question met with full approval, but a resolution to the Interstate Commerce Commission putting the association on record as favoring the rate advance asked by the roads was not so easily passed. Some contended that as the coal producers are not the ones who pay the freight on coal they are not the ones to endorse an advance in freight charges. The broader view, that the coal industry needs the railroads and should give this measure of support, prevailed, however, and on the last day of the convention the resolution was passed.



Daniel B. Wentz
President of the National Coal Association, 1920-1921.

Tuesday afternoon found many of the visitors on the golf links at Sea View, the country club having extended the courtesy of the course to the delegates. In the evening a meeting was held, at which the topic again was assigned cars. It is now clearly understood that the only hope for a release from this practice lies in legal action, the railroads standing on their rights as defined by Commissioner Clark of the Interstate Commerce Commission. Notwithstanding the pressure that is being brought to bear on the commission by interests opposed to the assigned car practice, those in touch with the situation are not hopeful for a change of attitude by that body.

Election of directors at large, which was held by secret ballot, occupied the early part of the morning on Wednesday. A spirited contest had been in progress from the previous day to gain these positions, of which four were to be filled. Interest in the outcome of the ballot did not interfere with the attention given to the speaker of the morning, Eugene Meyer, Jr., managing director of the War Finance Corporation. Mr. Meyer told in simple language the story of how and why the world has been financed since the war began in 1914, and made it plain that conditions cannot remain as they now are and crops be moved next fall. Throughout the country, Mr. Meyer said, there is a manifest disposition on the part of those engaged in industries and great business enterprises to bring about an adjustment of the economic situation. He pointed out that economy in these enterprises is as immediately essential as is economy with the individual. Not alone must the United States make sure that it produces enough for its own market, Mr. Meyer went on to say, but it must endeavor to create a surplus to meet foreign demands. All of Europe, he said, is looking to the United States for products, and if financial relations between this country and Europe are to be improved America must sell commodities in great quantities abroad. The whole world, he said, will need products from the United States for some time to come.

It has become more apparent than ever in the last few months, Mr. Meyer said, that the Government must take a greater interest in industry, and he urged at the same time that industry "must have a greater interest in the Government."

Wednesday evening the new officers for the coming year were announced, having been earlier selected by

the newly-elected board of directors. Moving pictures of the new mining machine that cuts, picks down and loads coal all in one operation were exhibited by the Jeffery Machine Co.

The last morning was the best of all. To begin, A. H. Smith, president of the New York Central, told the assembled operators of the tasks that confronted the transportation system of the country when we entered the war and how the roads, though lacking equipment and facilities for which they had been refused the revenue, met the demands of the war period.

President Taylor, in his closing address, said: "There is too much Government in business, and not enough business in Government." Eugene Meyer, Jr., managing director of the War Finance Corporation, however, thought that the Government should take a greater interest in industry, urging at the same time that industry "must have a greater interest in the Government."

In his speech Mr. Smith told the convention that the railroads of the country, in order to build the car equipment urgently needed, must spend approximately $700,000,000 at once. The New York Central lines in the last month, he said, had authorized the expenditure of $50,000,000 to buy coal cars and locomotives.

"We have a tremendous problem ahead of us in furnishing the transportation needed by the country's industries," said Mr. Smith. "Unless we can get the money with which to do it, the critical situation confronting the industry today will become worse. The people do not realize how acute the situation is today. Industries are in deep distress, all for the want of transportation. The coal industry is in distress; the steel mills are in distress. This country is in more trouble, I think, than it ever has been in, even in time of war, because of the need of this vital necessity, transportation.

"I know we are going to have a great deal of trouble during the coming winter because of this transportation problem. You can be pretty sure of it. We need co-operation everywhere if this country is to find the way out. The whole transportation system of the country is 'stymied,' but I am optimist enough to believe we will be able to work out the difficulty. To do it we must raise the money we need—we have simply got to do it."

Transportation Troubles to Continue in 1921

Dr. Charles A. Eaton, editor of *Leslie's Weekly* and famed as a student of men and a speaker to men, spoke last. It is putting it mildly to say that he brought the house to its feet—he did that and more, for he left impressions for good with every one that heard him. The next best thing to hearing Dr. Eaton is to read what he said, and we will publish his address in full in *Coal Age* in a coming issue. Some of his remarks should be noted at once.

"The one supreme thing that we are up against in industry is to get production," said Dr. Eaton. "The outstanding difficulty right now in industry is the lack of disposition of a great number of individuals to do the work that is ahead of them. The country is under a frightful nervous distraction as a result of the war. Mountebanks and demagogues are leading unthinking workmen astray. Antagonism to organized industry, hatred and suspicion have developed under a false leadership. What we must have is a better understanding all around.

"We must have a leadership that will educate. We must have leaders in industry as well as in governmental life who will show the people the evils of the existing trend and who will help the country pass out of the age of chaos and into a period of success. We must develop the human element among our working people. We must develop an appreciation of the responsibilities that confront those who govern our great industries. The leaders of industry themselves must get closer to their own men. If they do not, the men will go elsewhere for leadership.

"We can no longer leave this nation in the hands of the demagogue, the self-seeker and the ignoramus. Need of production today is so appaling that I fail to see how any one can sleep over it, and yet agitators are constantly demanding more wages, more wages and putting into the heads of the workers the idea of less work. Next year will see food prices higher than ever, and unless there is advanced production in other commodities, there can be no lowering of prices for anything.

"Unless all of us get down to the idea of increased production and abstaining from buying things that we don't actually need this country within the next twelve months will find itself worse off than it has been at any time since the war began.

"Conservative leadership all along the line is needed. Moral cowards who are spreading discontent must be put down. People must quit theorizing and get to work. We will win this fight for the readjustment of our economic life if we gird ourselves for the great fight ahead of us. It will take courage and strength to do it."

In the effort to end the freight tie-up and to help the railroads out of their difficulties the following resolution was adopted:

"Whereas, The present insufficient production of coal is directly due to the lack of adequate transportation facilities, and

"Whereas, The quickest way to rehabilitate the railroads and enable them to secure the needed equipment and give the service which will tend to reduce the cost of production of all commodities, including coal, is to re-establish railroad financial credit,

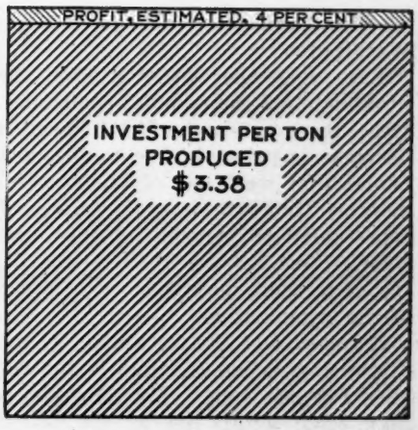
"Therefore be it Resolved, That the coal industry recognizes the need for an immediate increase in the revenues of the railroads, sufficient to insure their solvency and prosperity, by means of an increase in freight and passenger rates. However, the coal industry desires assurance from the Interstate Commerce Commission that this endorsement of an immediate increase in all freight rates will not prejudice the right of any parties interested to obtain redress hereafter, first if the differentials are inequitable as between different mines or different producing districts, and second, if rates themselves are excessive, unreasonable or discriminatory.

"The coal industry desires to call attention to the fact that coal consumers have already borne more than their share of increased cost of transportation and that the public welfare might be conserved by adopting a higher percentage of increases on freight of greater

Profits in the Coal Industry

With an average investment in developed coal lands and working plant of $2.62 per ton of output in 1918, the best year the industry ever had, the total investment in the bituminous coal industry is indicated to be more than $1,500,000,000, on which, according to the Bureau of Internal Revenue, earnings were made of 9.72 per cent.

The total investment in the bituminous industry was but slightly greater in 1919 than in 1918, but the output was 21 per cent less.



value and a lower percentage of increase than proposed on coal, which is the basis of industry."

In reference to the nationwide shortage of coal the association went on record as follows:

"The National Coal Association deplores the existing shortage in coal production and declares that present conditions are due solely to the lack of empty railroad cars in which to load coal at the mines, and to delays in transporting coal to destination."

The operators also expressed themselves as in favor of publicity in regard to the affairs of the coal industry, as shown in the following:

"The National Coal Association welcomed the opportunity afforded by the Frelinghuysen Committee of the United States Senate to present the facts before a fair and impartial tribunal in such a way as to better advise the people of the country as to the problems of the industry, because it recognizes the fact that many of the difficulties of the industry arise from lack of information on the part of the public."

To bring about the more general adoption of the standardized accounting system of the association this resolution was adopted:

"It is the sense of the members of the National Coal Association that the officers thereof use their influence for the general acceptance by the Government of the principles adopted by this organization for cost accounting so that there can be no disputes as to returns made to the Government or duplications thereof, thereby eliminating confusion and expense to the coal industry as well as to the Government."

In the matter of government regulation of industry the sentiment of the organization is clearly expressed in this resolution:

"The coal industry of the United States, represented by the National Coal Association, is unalterably opposed to the enactment of any legislation imposing additional regulation upon commerce and industry and is especially opposed to legislation which singles out any one industry for regulation by special commission."

Officers of the association elected to serve for the year 1920-1921 were as follows:

President, D. B. Wentz, Philadelphia, Pa.; Vice-Presidents, A. M. Ogle, Terre Haute, Ind.; Erskine Ramsay, Birmingham, Ala.; J. G. Bradley, Dundon, W. Va.; J. D. A. Morrow, Washington, D. C.; Treasurer, J. J. Tierney, Philadelphia, Pa.; Secretary, W. B. Reed, Washington, D. C.

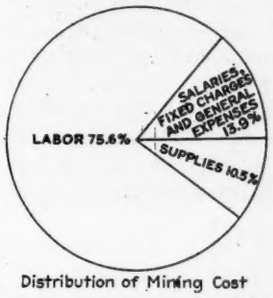
Directors at large, Philip Penna, Terre Haute, Ind.; Michael Gallagher, Cleveland, Ohio; J. P. Walsh, Pittsburgh, Pa.; D. B. Wentz, Philadelphia, Pa. Directors by fields, G. H. Barker, Ohio; C. E. Bockus, Virginia; W. D. Barnum, Washington; T. T. Brewster, Illinois; W. J. Carney, Montana and So. Wyoming; Ira Clemens, Kansas; E. M. Gray, Iowa; T. W. Guthrie, Pennsylvania; T. H. Watkins, Pennsylvania; W. H. Huff, Colorado and New Mexico; A. M. Ogle, Indiana; Erskine Ramsay, Alabama; C. W. Taylor, West Kentucky; R. T. Price, Arkansas, Oklahoma and Texas, and J. J. Tierney, West Virginia.

Geo. W. Reed succeeds F. S. Peabody (resigned), and C. W. Watson succeeds J. H. Wheelwright (deceased).

Bureau of Coal Economics

Work of the Bureau of Coal Economics of the National Coal Association was endorsed by the convention and a resolution was adopted promising the continued support of individual members and local associations in this work. It was pointed out that the need for accurate, comprehensive data on coal is greater today than ever before and that the key to success is the co-operation of the men in the field. The bureau can do nothing unless the figures are sent in to Washington. Vice-President Morrow said that the statement recently made by Commissioner Wooley of the Interstate Commerce Commission that with the 27-per cent increase in wages the operators had added $2 to the mine price of coal could not be refuted because the local associations had not furnished the National with the figures on realization, though they had repeatedly been called for.

What became of the Operator's Dollar in 1918.



Distribution of Mining Cost

Large scale charts showing the investment and profits of the coal industry, time worked and lost because of car shortage and for other reasons, the division of cost as between labor, supplies and other items and of receipts between various items of cost and profit, and one showing the relation of the increase of cost of production and short running time, were exhibited on the wall of the convention room. Some of these are reproduced herewith. The bureau has in preparation numerous other diagrams of distinct educational value and will

have a permanent exhibit at the headquarters in Washington.

Last year the National Coal Association had approximately 2,150 member companies. This year, 1919-1920, there are under 2,100 member companies. The decrease is primarly due to the number of small companies that went out of business in the past eighteen months. In 1918 the paid membership of the National represented 60 per cent of the total production of the country, whereas in 1919 it was 61.5 per cent, showing that there has been no decrease in the strength of the organization.

A measure of the work done by the Washington office of the association is found in the record of correspondence for last year. Mr. Morrow reported that more than 1,300 letters asking for information and advice were received from coal operators. In answer more than 1,400 letters were sent out, in addition to which some 12,000 circular letters were mailed to the membership and a vast amount of other material was furnished. It is estimated that about 40,000 letters of all sorts were mailed out by the Washington office in the year just closed. More than 5,000 telegrams were received asking for immediate service from the Washington staff. In reply 6,334 telegrams were sent out. The Washington office answered more than 800 long distance telephone calls on important matters and called 981 times.

Having completed its third and most successful year, the association expressed its appreciation and thanks to its officers and directors for their contribution to the accomplishment of such splendid results.

Reserve Board Lays Low Coal Supply to Inadequate Car Supply

IN reviewing the general business situation for May, the Federal Reserve Board comments on the coal situation as follows:

"Coal conditions have been particularly important in connection with iron and steel, as with other industries. The state of things in regard to coal is now very acute in some districts. In district No. 2 (New York) the supply is far below the demand and consumers are bidding against one another. Railroads 'are more or less the victims of systematic sabotage at their terminals.' Car supply at the mines is only 30 per cent of normal, while the labor situation there also is unsettled. The situation as a whole 'is such as to cause considerable concern among conservative coal men' and transportation is regarded as a fundamental factor requiring improvement.

"In the Middle West (district No. 4—Cleveland) coal shipments have fallen off. At Lake ports during April they were about one-third of what they were in April, 1919. Lake shippers will pool their coal in order to increase the movement, but this is only a partial remedy. Fuel prices are the highest on record in the Lake trade. Not only does a general shortage of coal exist now but a shortage is foreseen for next winter which may curtail production of iron and steel at interior furnaces.

"In district No. 6 (Atlanta) coal production is being held down, mines being able to get an insufficient number of cars. Labor, however, shows no discontent and there is small movement of coal in foreign trade. Railroads throughout the district have placed orders for fuel for the next twelve months, 'the amount in every instance being larger and the price higher than ever before.'

"Production of bituminous coal for the country at large during April amounted to 32,006,000 tons, as compared with 46,792,000 tons during March and 32,164,000 tons during March, 1919, the respective index numbers being 86, 126 and 87. Labor difficulties, although sporadically existing, appear to be a relatively minor factor in coal production as compared with the influence of car shortage. No reduction of prices is in sight."

Ten Million Barrels of Oil a Year Required by the Navy

NAVY requirements for fuel oil for the next fiscal year will be in excess of 8,000,000 barrels. This is in addition to 2,621,000 gallons of lubricating oil needed. This is the estimate of Admiral R. S. Griffin, chief of the Bureau of Steam Engineering. In connection with a statement as to the navy's oil requirements Admiral Griffin said:

"The demand for oil for the navy alone looks very formidable in comparison with the requirements of two or three years ago. When it is considered that a large number of merchant ships completed during the last three years also burn oil, and that many industrial establishments recently have converted their power equipment to oil burning, the question of an adequate supply of fuel oil for the navy becomes one of great concern.

"I share the view of many regarding the national importance of conserving our oil. Without an assured supply our navy would be practically useless, and I shudder to think what the result would be if anything should occur that even remotely would threaten this supply.

"We now have in commission seven battleships of a combined horsepower of 204,000 which burn oil only. In addition to these we have building twelve other battleships of 533,000 hp.; six battle cruisers of 1,080,000 hp.; and ten scout cruisers of 900,000 hp.; making a total under construction of these three classes of ships aggregating 2,513,000 hp.

"In oil burning destroyers we have actually completed 234 with an aggregate horsepower of 5,626,000, and have under construction eighty-seven others which will be completed during the next fiscal year and will bring the total horsepower of destroyers up to 7,975,000.

"Our submarines already completed aggregate about 80,000 hp. in Diesel engines, and those under construction will more than double this figure.

"Besides these vessels of a purely military character, we have others such as mine sweepers, tugs, destroyer and submarine tenders, and fuel ships in which oil is used as fuel, whose horsepower aggregates 173,400.

"To sum up, we actually have completed and ready for service vessels aggregating more than 6,000,000 hp. in which oil alone is used for fuel, and have under construction other vessels which will bring this total up to nearly 9,000,000 hp."

H. Mortimer Lamb, secretary of the Canadian Mining Institute, owing to ill-health has been obliged to resign his position as secretary of the Canadian Mining Institute. His resignation, on being conveyed to the Council, was regretfully accepted.

NEWS FROM THE CAPITOL

BY PAUL WOOTON

Senate Passes Bill to Sell Government-Owned Ships to Private Buyers

ON May 21 the Senate—no record of the vote being given—passed the House Merchant Marine bill providing for a permanent merchant marine policy. The measure provides for the sale of Government-owned ships to American citizens or corporations as soon as advisable and, pending such sale, for their operation either by the Government or under lease.

Trade Commission Reports Producing Costs in Alabama, Tennessee and Kentucky

COAL producing costs in Alabama, Tennessee and Kentucky have just been made public in the Federal Trade Commission's latest report. It is the fourth report of its kind. The first report covered the production of bituminous coal in Pennsylvania; the second report covered the production of anthracite in the same state, while report No. 3 covered the production of bituminous coal in Illinois.

The tabulation of costs in Alabama refute most decidedly the sensational charges of profiteering made last year by Representative Huddleston. The compilation shows that for district No. 1 sixty-three cents of each dollar paid for coal at the mine went to labor, fourteen cents for supplies, thirteen cents for general expenses, and ten cents went to the operator, from which ten cents sales expense, interest and Federal taxes must be deducted. The remainder is the operator's profit. Similar divisions of costs for the other Alabama districts are shown.

One point in the report, the unreliability of averages, is brought out with particular clearness. One of the tables covering operations in Tennessee district No. 1 shows a drop of forty cents in the sales realization for September as compared with August. It happened that a strike closed down the mines in the district which had been receiving the higher average sales realization. Those which continued in operation happened to have comparatively low sales realization. As a result the average sales realization was in no way typical for the field.

Among the new features brought out in the No. 4 report are figures having a bearing on the coking of coal by producers. One of the tabulations compares costs, sales realizations and margins between operators who coked different proportions of their output.

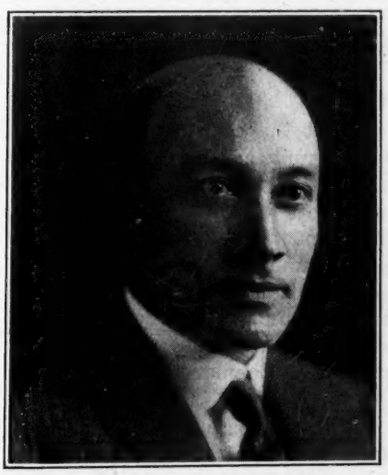
The report points out that diverse conditions exist in the districts covered and that there is danger in applying widely some of the generalization drawn. In that connection the commission says:

"It is desirable to point out the diverse conditions which have existed during the past three years between the different coal-producing districts in Alabama, Tennessee and Kentucky. There were districts where a period showing a lower margin than the preceding period had an increase of output. There also were districts where a period showing a higher margin than its preceding period had decreased production.

"The explanation of such different results must be sought in the particular conditions which have existed in each producing district. There is great danger in applying widely some of the generalizations drawn from the experience of particular districts or states. The collecting of definite up-to-date information covering the whole industry and making it readily available for use is, therefore, highly desirable."

Walter Durand Takes Charge of Coal Cost Compilation

WITH the Federal Trade Commission's coal activities in the limelight there is particular interest at this time in the man who actually handles the cost figures and who directs the compilation of the reports on costs of production. Since June 1 Walter Durand has been in charge of this work. He succeeded David L. Wing, who has opened an office as a consulting economist. Mr. Durand is well known among anthracite operators, as it was he who had charge of the anthracite investigation conducted by the Federal Trade Commission shortly before the war. Mr. Durand was born in Romeo, Mich. His early education was obtained in the public schools of South Dakota and Ohio. He was graduated from Oberlin College in 1896, and did his post-graduate work at Harvard. He devoted several years to teaching and was a member of the faculty at Phillips Andover Academy at Andover, Mass., and at Oberlin College. He entered the Government service in 1908 as an economist in the Bureau of Corporations, which was absorbed later by the Federal Trade Commission. He was in charge of the foreign trade investigation from which the Webb-Pomerene Act was an outgrowth. For several years he has occupied the position of assistant chief economist of the Federal Trade Commission.



WALTER DURAND

Miners' and Operators' Trial Set for November 8

Judge Anderson Overrules Hughes Demurrer and Motion to Quash Indictment, Declaring Section 9 of Lever Act Constitutional

WITH the decision May 26 of Judge A. B. Anderson, of the Indiana District Federal Court, that section 9 of the Lever Act is constitutional and the overruling of a demurrer presented by Judge Charles Evans Hughes on behalf of the indicted mine workers' officials, the case of fifty-seven bituminous operators and miners was set for trial Nov. 8. All those indicted pleaded not guilty. The judge's decision was made on a motion by Judge Hughes to quash the indictments.

The decision as to the constitutionality of the Lever Act overruled the motion to quash in so far as the five counts of the indictment based on Section 9 were concerned. Section 4 and Section 26 of the original Lever Act and Section 4 of the amendment of Oct. 22, 1919, upon which thirteen other counts of the indictment were based, were held unconstitutional and void by the Court in his ruling.

Argument on the demurrer to the indictment was begun by Mr. Hughes immediately after the ruling on the motion to quash. Passing the question of the validity of the section upon which the remaining counts were based, Mr. Hughes contended that Section 9 of the act did not apply, but was superseded by the action of the President in regulating the fuel industry under the powers granted him by Section 25 of the same act.

He held that during the time regulation of the coal industry was effective under section 25, the general statute, section 9, did not apply, but was overridden by section 25, which was specific in regard to the coal industry.

Mr. Hughes' second line of attack upon the indictmen was the contention that the counts of the indictment were defective and insufficient in that they were couched in such vague, indefinite and general terms as to not inform the defendants of the charges against them. He said the Government had no right to come into court with a general "omnibus" statement that the defendants had limited facilities. He cited a parallel case under the Espionage Act in which a demurrer had been sustained because of the vagueness of the averments, which he asserted were no more indefinite than those in the present case.

In a supplemental argument Samuel D. Miller, in defense of the operators, stressed the contention that Congress had not meant section 9 to be applicable during the period in which section 25 was in effect.

"Why didn't Congress say so?" queried the Court.

"I was not a member of Congress at that time, your Honor," Mr. Miller replied.

"Well you haven't got that to answer for," rejoined the Court.

Pleas of not guilty were entered by the following Indiana operators: H. M. Ferguson, David Terhune, Robert J. Smith, Henry Smith, Archibald Spears, George A. Anthony, William J. Hamilton, John A. Templeton, William Epperson, Banus E. Neal, Valentine Martin, Alfred M. Ogle, Jabez Wooley, William P. Zimmerman, Thomas Byers, M. E. Mogg, David Ingle, W. H. Tobin, William Zeller, Edward Shirkie, Edward Hackett, George A. Van Dyke, William J. Freeman, Edwin D. Logsden, Phil H. Penna, G. H. Richards, Hugh Shirkie, Homer B. Talley, Walter D. Talley, Warren F. Smith, Frank Thorpe and John Kelly.

The following Indiana mine worker officials entered similar pleas: John L. Lewis, president of the United Mine Workers of America; Philip Murray, vice-president of the United Mine Workers; William Green, secretary-treasurer of the United Mine Workers; William Raney, William Mitch, John Hessler, James A. McKinney, Harry Such, Charles Fettlinger, Harry Lentz, U. G. Hall, John Little, Jack McQuade, John Chesterfield, Robert Perry and Ed Haverkamp.

Pennsylvania miners who entered pleas of not guilty are: William C. Cavanaugh, P. T. Fagan, Robert R. Gibbons, William Hargest, Thomas Hughes, Frank Leithold, John McWee and John O'Leary.

Those indicted from Illinois and Ohio were not in court pending a settlement of their suits to prevent prosecution in the Indiana court.

The ruling by Judge Anderson is expected to have a material effect on the prosecution of alleged profiteers in the Indiana district. Section 4 of the act as amended was one of the sections held unconstitutional and it was under this section that Charles P. Tighe, special agent in charge of the Bureau of Investigation, made affidavit against an Indiana company recently.

Indiana Strip Mine Operators Grant Most of Workers' Demands

AFTER granting most of the mine workers' demands the joint convention of the strip miners and the strip mine operators of district No. 11 adjourned May 25. All matters not decided were taken under advisement by a joint committee. First of the miners' requests, that which gave the mine committee jurisdiction over the mine engineers, was granted with little discussion. The fourth demand, making the time and one-half pay for over-time work apply to pumpers, night watchmen and boiler cleaners, also was granted. The fifth, which had to do with an increase in the death benefits, was granted and it was agreed to rewrite section 19 regarding the promotion of men according to seniority.

The sixth demand, however, which asked that steam shovel men be increased to $225 a month and that all other monthly men be brought up to the 20 per cent increase awarded by the national commission, was denied in part by the operators. They refuse to give any increase except that awarded by the commission.

Regarding a recent rumor to the effect that the organization was about to be dissolved Phil H. Penna, secretary of the Indiana Bituminous Coal Operators' Association stated emphatically that there was nothing to the rumor. "When the scale committee, composed of representatives from every sub-district in the state, made the wage scale," said Mr. Penna, "there were some who did not agree with the scale. In an organization of one hundred members it is always impossible to please every member on every point. In this connection there were four operators, Ed Shirkie, Grant Coal Co., Stewart Shirkie and the W. S. Bogle Co., who paid the increase asked by the shotfirers. But they paid it from the start and have never closed down their mines because of any controversy with the shotfirers. The report that they have resigned from the organization or that the organization is going to be abandoned is ridiculous."

Public Utility Power Efficiency Shown in Geological Survey Reports

REPORTS of the U. S. Geological Survey show a very interesting relationship between the power production and the efficiency with which the fuels are used in the various public utility central stations throughout the country. The following tabulation shows the total power output and the efficiency expressed in kilowatts per ton of coal used for each of the seven months for which reports have been made. Some of the variation is undoubtedly due to seasonal factors, but the principal factor probably is the greater percentage load factor during recent months as compared with the period about a year ago. These figures, of course, cannot be taken as absolute in their significance, but are a good indication of the general practice.

Month	Millions of Kilowatt Hours	Efficiency Kw.-Hrs. per Ton of Coal
1919:		
February	1,834	586
March	1,842	580
April	1,718	594
July	1,929	636
October	2,240	645
1920:		
January	2,575	643
February	2,327	632

Another interesting point shown by the figures is the relatively greater average efficiency of central stations in states where most of the power is generated at large plants. For example, in Pennsylvania, Illinois, Ohio and other states where large cities predominate the efficiency is about 600 kilowatt hours per ton of coal or even higher, being nearly 800 in the case of New York and Michigan.

On the other hand, in more sparsely settled states, such as North Dakota and Montana, the average is only 150 to 200 kilowatt hours per ton. This is a striking illustration of the great advantage which the proposed super-power plants will have if installed to substitute for existing central stations. When we see the average for whole states five times that for other states we can readily believe that the estimated saving of 50 per cent of the coal now used in all central stations would be feasible if all were replaced by a super-power system.

Record Petroleum Output in March

IN SPITE of constantly increasing domestic production of petroleum, consumption is increasing at an even faster rate, and stocks continue to be correspondingly depleted. The March production of petroleum, amounting to 36,491,000 barrels, a daily average of 1,177,129 barrels, is the greatest on record for any one month. These figures compare with a daily average of 975,290 barrels in March, 1919, and of 956,903 barrels in March, 1918. If production continues for the rest of the year at the rate established in the first quarter the total for 1920 will be in excess of 410,000,000 barrels, according to the Geological Survey.

Stocks of domestic petroleum held by pipe-line and other marketing companies at the end of March amounted to 125,291,000 barrels, marking the continued withdrawal of stocks which has been in progress since September, 1919. The greatest decrease (1,132,000 barrels) occurred in California, where the large drafts on stocks which have been reported in recent months continues. Gulf Coast stocks also were depleted 445,000 barrels during March.

It should be observed, however, that these large withdrawals of stocks of heavy oil were in part counterbalanced by small gains in stocks in other fields, the most notable being a gain of 323,000 barrels in the Appalachian field. Stocks of Mexican petroleum held by importers have not been collected for a long enough period to show significant results, but a reduction of stocks of imported oil is also reported.

Imports for March established a record, the total amounting to more than 6,500,000 barrels, exceeding the imports for March, 1919, by more than 3,000,000 barrels. Exports of crude oil, amounting to 861,486 barrels, were almost four times the quantity exported in March, 1919.

Total consumption of petroleum in March, 1920, exceeded total consumption in March, 1919, by more than 12 million barrels. If consumption continues for the rest of the year at the rate established in the first three months the total will be in excess of 495 million barrels. The March daily rate of consumption exceeded the daily rate of domestic production by more than 240,000 barrels.

Manning Opposes Transfer of Fuel Yard to Non-Technical Bureau

IN connection with a bill which has been introduced by Representative Wood of Iowa, Director Manning of the Bureau of Mines has written the author of the bill explaining why in his opinion the Government Fuel Yard should not be transferred to the proposed Bureau of Supplies. Extracts from his letter follow:

"I am especially interested in the provision in the bill to transfer the Government Fuel Yard work to the new Bureau of Supply. During the period of nearly two years since the establishment of the Government Fuel Yards no Federal or District government heating or power plant has been obliged to let its fires go out or curtail its coal consumption because of the failure of its coal supply.

"I think you will agree with me, in view of the coal situation and different strike conditions during that period, that this is a particularly good record. The point I wish to make is that I do not think this record could have been established, and I do not believe it can be maintained, upon a basis of simply earnest, hard, overtime work by the Government Fuel Yards as a separate, purely business organization.

"There are certain of the established duties of the Bureau of Mines that tie into the Government Fuel Yard work to spell, in my opinion, the difference between only a fair or perhaps poor handling and an efficient and successful handling of that work. The bureau is the Government authority on the subject of the selection of coal for different fuel-burning equipment and the adaptation of fuel-burning equipment to different kinds of coal. The engineers engaged in this work as the general supply committee, a purely business organization, did not see several years ago the advantage and economy to the Government in arranging for the selection, purchase and distribution to the Government establishments in the District of Columbia of the coal needed by such establishments.

"The services of these engineers in the regular coal work of the bureau have been of the very greatest value in the guidance and handling of the Government Fuel Yard work. The handling of that work has been, and

will continue to be, not a purely business matter of purchasing and distributing coal, but also a matter of applying engineering knowledge and technical skill to the reduction of the Government coal bill.

"At the present time, when the Navy Department is able to fill its coal requirements outside of Washington only by commandeering coal, the Bureau of Mines is obtaining, through the assistance coal mine operators are rendering upon the basis of the co-operation developed in mine safety and other work during the past ten years, sufficient coal for the needs of the Government Fuel Yards.

"I strongly favor the main purpose of your bill. I think that a central purchasing agency can purchase and deliver desks, file cases and other office supplies more economically than individual departments and government establishments can; but the purchase of this one commodity, coal, is already centralized in a single agency in the Government Fuel Yards, and I have endeavored to indicate my firm conviction that the selection of coal for the Federal and District governments in Washington, the purchase of this coal, its storage and its distribution, can all be handled to the best advantage by the retention of this work in the Bureau of Mines."

Commission Grants Coal Association Request On Coal Freight Charges to Canada

THE Interstate Commerce Commission has granted in its entirety the request of the American Wholesale Coal Association with regard to payment for coal transportation between the United States and Canada, dissatisfaction having arisen because of unsettled rate of exchange. To the existing ruling in regard to payment for transportation the commission has ordered that the following be added:

"The existing difference in exchange value between the moneys of the United States and the Dominion of Canada, while continuing to bear the same denomination, has been productive of confusion and uncertainty as to the construction to be placed upon tariff schedules, division sheets and accounts in respect of traffic crossing the international boundary.

"We are of opinion that where transportation of persons or property or transmission of intelligence by wire or wireless takes place partly within the United States and partly within the Dominion of Canada, the tariff charges or divisions thereof accruing for the part which takes place within the United States are payable only in lawful money of the United States, irrespective of the money in which tariff charges or divisions thereof accruing for the part which takes place in the Dominion of Canada may be payable under the laws there in force.

Rate Schedules May Include Regulations

"Adjustment should be made in accordance herewith by carriers subject to the act in settling their accounts with connecting carriers. Appropriate rules or regulations to give effect to this ruling may also be included by such carriers in their tariff schedules, if they so desire.

The practice, which has grown up since development of said difference in exchange values, of requiring prepayment of charges in cases where not customarily required theretofore tends to embarrass shippers and impede foreign commerce. Carriers subject to the act will be expected to refrain from such unusual requirements in cases where they are not justified by other considerations."

The regulation to which the foregoing was added reads as follows:

"Nothing but money can be lawfully received or accepted in payment for transportation subject to the act, whether of passengers or property, or for any service in connection therewith, it being the opinion of the commission that the prohibition against charging or collecting a greater or less or different compensation than the established rates or fares in effect at the time precludes the acceptance of service, property or other payment in lieu of the amount of money specified in the published schedules."

New York Lighting Companies Use 3,453,408 Tons of Coal a Year

Gas Companies Also Consumed 88,785,797 Gallons of Gas Tar and 218,018,831 Gallons of Gas Oil—Made 378,438 Tons of Coke

MORE than three million tons of coal and coke was used in the manufacture of gas and electricity by the various gas and electric lighting companies in New York City in 1919, according to reports filed with the Public Service Commission. Of this tonnage the gas companies used 1,645,619 short tons of coal and coke, and the electric lighting companies used 1,806,789 short tons of anthracite and bituminous, a total of 3,453,408 tons.

COAL AND COKE CONSUMPTION BY GAS COMPANIES

	Boiler Fuel Coal	Boiler Fuel Coke	Gas Coal Carbonized	Under Retorts Coke	Generator Fuel Coal	Generator Fuel Coke
Consolidated Gas Co.	10,603	9,519	406	513	80,998	39,398
Astoria Light, Heat & Power Co.	27,302	....	468,268 (Bit.)	48,612	120,200	C.&C.
New Amsterdam Gas Co.	17,477	C.&C.	.....	.....	103,320	C.&C.
N. Y. Mutual Gas Co.	9,440	....	.....	.....	54,515	C.&C.
Standard Gas Light Co.	4,695	C.&C.	.....	.....	40,816	C.&C.
Central Union Gas Co.	9,139	C.&C.	80,421	10,637	45,165	C.&C.
New York & Queens Gas Co.	2,478	....	.....	.....	.....	.....
	562	gas coal	.....	.....	6,573	.....
Brooklyn Borough Gas Co.	3,185	....	.....	.....	11,031	.....
Kings County Lighting Co.	14,698	....	.....	.....	25,304	.....
Brooklyn Union Gas Co.	55,179	....	.....	.....	299,852	C.&C.
Bronx Gas & Electric Co.	10,416	....	.....	.....	3,343	.....
	130	gas coal	.....	.....	.....	.....
Queens Borough Gas & Electric Co.	4,323	....	.....	.....	8,835	.....
New York & Richmond Gas Co.	6,414	....	.....	.....	11,852	.....
Totals	176,041	9,519	549,095	59,762	811,804	39,398

In addition to the consumption of coal and coke the gas companies in Manhattan and The Bronx used 14,254,558 gallons of water-gas tar and 129,233,034 gallons of gas oil in the making of gas, while the companies in the other boroughs of the city used 12,305,157 gallons of water-gas tar and 88,785,797 gallons of gas oil, a total of 26,559,715 gallons of water-gas tar and 218,018,831 gallons of gas oil.

Three of the gas companies made 378,438 tons of coke during the year, of which they sold 119,479 tons for $669,660.03, an average of $5.59 per ton.

The reports show that the various electric lighting companies consumed the following tonnages:

	Anthracite	Coal	Bituminous
New York & Queens Electric Light & Power Co.	6,441	.....	1,770
New York Edison Co.	.....	948,651	.....
United Electric Light & Power Co.	.....	334,553	.....
Flatbush Gas Co.	21,242	.....	1,657
Brooklyn Edison Co.	16,428	.....	427,618
Queens Borough Gas & Electric Co.	.....	.....	15,154
Richmond Light & Railroad Co.	33,275	.....	.....
Totals	77,386	1,283,204	446,199

The Labor Situation

Edited by
R. Dawson Hall

Railroad-Shop Strike Makes Coal Mine on Virginian Line Lie Idle

A STRIKE of shopmen and car inspectors on the Virginian R.R. at Princeton, W. Va., an important divisional point of the road, during the third week of May not only interfered with transportation but also played havoc with coal production on the road. In many instances production was brought to a standstill owing to the road's inability to supply cars and move coal trains, the railroad company being short of motive power. Twelve hundred men were involved in the strike, which grew out of the fact that the company had discharged a boilermaker. Shop employees demanded his reinstatement. When the company refused the shop employees went on strike.

Claimed Right to Load Pyrite as Coal

A STRIKE at the plant of the Consumers' Coal Co., located at Downs, in the Marion County (W. Va.) field, was declared by miners employed at the plant on Wednesday, May 19, following the discharge of three men. Fully 250 miners failed to report for duty on the date named, taking such action following a meeting the night before at which it was decided to strike unless the three men discharged were reinstated.

The company claims that they were discharged for persisting in the loading of dirty coal though they had been cautioned time and again to abstain from doing so. It is even said that one of the three men discharged loaded sulphur balls weighing as much as 250 lb. each in his cars. The miners assert that the company had issued no warnings against loading "dirty coal" but fined men when they loaded it and added that it was easier to pay the fines than to separate the impurity.

The strike was finally settled during the latter part of the week in which it began, officials of district 17 conferring with the miners and the latter as a result agreeing to go back to work provided the men discharged were reinstated. That was agreed to and the striking miners returned to the mines.

Star Chamber Proceedings Against Peters

MUCH mystery surrounds the bringing of charges by C. F. Keeney and the District Board of district 17 against H. E. Peters, president of sub-district 4, an area covering a part of northern West Virginia. Peters is charged with having circulated false statements about the president of district 17. So far Peters has authorized no statement for publication, declaring that any statement to be made public should come from the district board which is trying the case.

Keeney, the district president, has declined to give any publicity to the charges against Peters, stating that the matter is pure'y an internal affair and therefore what transpires should be kept within the organization and not given to the public. He has heretofore stated that nothing will be given out in connection with Peters' trial.

There has been more or less friction between Peters and Keeney for some time and the charges against Peters, whatever they may be, are not therefore regarded as surprising. As Keeney will act as judge and appoint the jury, the verdict, it is predicted, will hardly be favorable to Peters.

Employees Strike at Raymond City, W. Va.

OPERATIONS at one of the large coal plants in Raymond City, Putnam County, West Virginia, were almost totally suspended on Tuesday, May 18, when about five hundred miners went on strike. They objected to an order of the superintendent of the plant governing the mining and loading of coal and promptly proceeded to register their dissatisfaction by quitting work. It was believed, however, that the strike would be of short duration.

Wage Agreement Concluded in Wyoming

AFTER several days of joint session at the Plains Hotel, Cheyenne, Wyo., a wage agreement was reached on May 22 between mine operators and mine workers of district No. 22, which covers the State of Wyoming. The minimum wage for men underground is $6.28 and for workers on the surface is $5.44. An increase of 24c. per ton is granted on a'l coal produced and of $1 per day for all daymen. An advance of 20 per cent is given all hands for deadwork and yardage.

Mingo Operators Have Not Closed Mines

ALTHOUGH it was stated that all mines in Mingo County, W. Va., would be shut down pending a settlement of the labor trouble in that county it is learned that only about half a dozen companies have shut down entirely. Other companies, of course, have been operating with curtailed forces and production in the field naturally has been materially reduced as a result of the labor difficulties in the Williamson field.

Labor Department Has 28 Strikes to Settle

H. L. KERWIN, Director of Conciliation, in issuing a report of labor disputes for the week ended May 8, states that on that date there were twenty-eight strikes before the Labor Department for settlement, and in addition fifty-seven controversies which had not reached strike stage.

Anthracite Wage Dispute Will Be Submitted to Arbitration

Operators Offered Increase of 65 Per Cent. on 1916 Wages and 17.8 Per Cent on Wage Scale Existing Prior to April 1

AFTER declaring that they would not submit the anthracite wage dispute to arbitration the mine workers at their tri-district convention in Wilkes-Barre on May 27 finally decided that it was the only way to secure a better settlement than their leaders had been able to obtain. Waging a successful strike, the representatives of the mine workers say, has been made "almost humanly impossible" because of "class legislation." Therefore they accepted President Wilson's offer to appoint an arbitration committee for the adjudication of the matter.

Meantime they will remain at work "under the retroactive understanding agreed to between the operators and miners and reiterated by the President, which will protect the mine workers in wage increases as from April 1." The contract that Secretary of Labor Wilson submitted, which was the maximum offer of the operators, was rejected without an opposing voice. Yet this offer had received the approval of the international officers of the United Mine Workers of America. This agreement would have provided for a 17.8-per cent advance above the wages now being paid and would have given the mine workers at least a part of that recognition for which they have long craved.

James Gorman, secretary of the Board of Conciliation and secretary also of the wage conference, was informed of the decision of the tri-district convention and was also requested to arrange for a meeting of the scale sub-committee of mine workers and operators on Monday or Tuesday of the present week.

It was announced by Thomas Kennedy, now and for many years president of district No. 7, that the President would be informed that Neil J. Ferry, of McAdoo, Pa., would be a satisfactory member of the commission to represent the interests of the mine workers. The President has expressed himself open to a suggestion of this kind.

The convention recommended that the President "take such action as will permit the United States Government to take possession of four anthracite coal mines and one coal washery." The delegates desire that an investigation be made by the light of the operation of these mines so as "to protect the consumer against excessive charges," while paying the mine worker, if possible, a scale that will be uniform throughout the anthracite field and compensating the miners on the legal-ton basis such as is used by the operators in the sale of their coal.

The terms of the agreement submitted to the convention and rejected by it were as follows:

1. Agreement to be made with the United Mine Workers of America of the first part.
2. Agreement to run for a period of two years.
3. Contract rates at each colliery to be increased 65 per cent over the 1916 basis. This means an increase of 17.8 per cent over the present gross earnings, or an increase of 19.5 on net earnings.
4. Increase for outside and inside day men who receive from $1.54 up to be 65 per cent on the 1916 basis, plus an increase of $1.20 per day, with a minimum rate of $4 per day and a maximum of $6 per day. This means an increase of from 66c. to 75c. per day over present wages.
5. Employees receiving less than $1.54 per day to be increased 30c. per day over present wages. (This provision refers solely to boys.)
6. Contract miners' laborers to receive the same increase as company laborers, and the companies to bear their share of the increase, as is now the case.
7. Monthly men to receive an increase of 65 per cent on their 1916 basis plus $30 per month, it being understood that the increase over present rates shall not be less than $20 nor more than $30 per month.
8. Employees of stripping contractors to receive the same increase as received by those in similar occupations at the collieries.
9. Increases to be applied on the work day established in 1918, whether eight hours or more.
10. Inside pumpmen and outside and inside hosting engineers working twelve hours to be put on an eight-hour basis, the conciliation board to work out the new eight-hour rates. Until this rate is fixed by the board the men affected to continue on present basis of increase and hours.
11. Board of conciliation to act as a commission to study and report to the next conference on uniform day rates.
12. Tools lost by contract miners through squeezes, caves, etc., to be replaced by company.
13. Contract miners when reporting for duty and shut out of work shall be given opportunity for other places of work at the established rates for such work, provided such work or places are available.
14. Permitting contract miners to report deficient or abnormal conditions to the foreman and if they disagree the case to be taken up as other grievances are handled.
15. Agreement to be signed by the officers of the United Mine Workers of America and the coal operators.

Arrest Mine Worker for Matewan Massacre

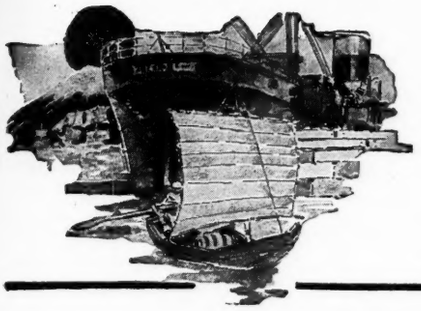
THE first arrests in connection with the death of seven Baldwin-Felts detectives and three others were made on Monday, May 24, when Sidney Hatfield, chief of police of Matewan, and nine others were taken into custody and removed to Williamson, where they were arraigned before Judge James Damron in the Mingo Circuit Court, being charged with the murder of L. C. Felts and other Baldwin-Felts detectives. All those arrested waived examination and were released on bond in the sum of $5,000 each. In addition to Hatfield the following were arrested: Reese Chambers, Clare Overstreet, Charley Kiser, Douglas Mounts, a man named Chambers, Ezra Fry, Billy Bowman and two others.

The arrested men were taken to Williamson in the custody of Colonel Jackson Arnold and other members of the state police force. In addition to those already arrested warrants have been issued for fifteen miners and for the four surviving members of the party alleged to have been at Williamson during the shooting.

Would Keep One-Armed Man on the Job

MINERS employed by the Deaker Coal Co. near Kingwood, W. Va., were on strike for several days during the third week of May, objecting to the discharge of a one-armed engineer who had been relieved of his work as engineer and given work more suitable to his physical capacity. The striking miners, however, after being on strike for several days finally agreed to return to work pending a permanent settlement of the trouble.

Owing to lack of space it will be impossible to publish the scale of subdistrict No. 5 of the Ohio district in this issue. It will appear next week.



Foreign Markets and Export News

Montreal Loses Line of Coal-Carrying Vessels

The Black Diamond line of freighters, which before the war brought to Montreal 2,000,000 tons of coal annually from Nova Scotia, will not run on that route this season. The reason assigned is the greatly increased consumption of coal by the steel companies of Nova Scotia, combined with a falling off of coal production at the mines. Another important factor is the high cost of bunkering in Britain, which compels British vessels to fill their bunkers at Sydney, thus further reducing the supply for Canadian consumption.

Spain's Coal Mines Urgently Need Tariff Protection

Chester Lloyd Jones, commercial attaché at Madrid, Spain, reports that the great natural resources of industrial energy possessed by the Kingdom are neglected. The coal mines are inefficiently exploited. There is only a rudimentary development of water power. There is no system by which the two are used in co-operation for supplying energy for national industry. Without some method of utilizing these resources industry cannot prosper, for they are the sources of its life under modern conditions. In turn they will be the consumers of the products of many other lines of industry. This indicates that once they are developed they will not only make other industries possible but create a demand for their products.

The coal industry should be given greater tariff protection. It has had assistance supplemental to the tariff rates, such as exemption from taxes on exploitation and the grant of special bounties in certain cases. All these were suspended during the war. Although the exceptional circumstances created by the war cut down foreign competition and brought Spanish coal mines to a state of abnormal prosperity, a ruinous foreign competition is now faced, which demands not only the re-establishment of all the assistance formerly granted, but its increase.

It is to be noted that during 1919 the coal industry was, in August and September, anxious to secure authority to export coal. This condition, it is alleged, was transitory, and the exhaustion of the surplus produced during the abnormal conditions just passed would make it impossible for the local mines to compete with foreign trade.

In spite of the fact that mining is one of the oldest and best-developed branches of industry in Spain, the country profits little from the exporting of its resources. Even those branches the fostering of which is demanded for national defense, are unworked. They are favored by special legislation in the law of July 22, 1918, and the royal order of July 25 of the same year, but as yet no real advance has been made. It has also been sought to stimulate all branches of the mining and metal industries through the provisions of the tariff, but thus far without success.

Germany Exploits Synthetic Fuel Oil

Bergbau (mining) reports, according to an announcement from the European Division of the U. S. Bureau of Foreign and Domestic Commerce, state war-time experiments in Germany showed that the distillation of lignite at a high temperature gave a liquid coal tar which contained certain ingredients suitable as a substitute for gasoline, kerosene and lubricating oils.

Through a new process benzine and kerosene can be obtained from liquid coal tar, which has been distilled from lignite at a lower temperature, and all industries using lignite are urged to set up facilities for generating this liquid coal tar and thus secure synthetic products to supply the lack of the natural products.

It is interesting to remark that, at this time when there is a shortage of fats in central Europe, German newspapers are advertising a liquid tar soap containing a percentage of alcohol, for shaving purposes. This is undoubtedly a byproduct.

Plan to Increase Coal Output in Ireland

Industrial expansion in Ireland, *The Statist* (London, England) states, is undoubtedly very seriously retarded by the relative insignificance of its coal-mining output. Dependence on Great Britain is practically universal in this connection, as the import figures eloquently testify. In 1918 imported coal totaled 4,301,083 tons, while the output of the home mines was 92,001 tons.

That the latter figure can be increased is the confident expectation of Irish colliery managers. Now that the Leinster and Arigna fields are fairly well served by railway communications and additional mining plant and pumping machinery have been installed, there is every hope that this expectation will be justified. Well over 90 per cent of the Irish coal raised is anthracite, and engineers, from practical experience, find that for gas production it answers all their purposes admirably.

France Faces a Coal Deficit of 40,000,000 Tons

Consul Ernest L. Ives, Paris, reports that the coal resources of France contained in deposits lying at a depth of not more than 3.937 feet are estimated at 13,143,000,000 tons, and at a depth of 5,905 feet, at 17,600,000,000 tons.

France's coal production in 1913 was 40,844,000 tons (including 793,000 tons of lignite), and consumption, including coke expressed as coal, 63,904,000 tons; the additional 23,060,000 tons being imported from England, Belgium and Germany. The future estimated French deficit of coal, due to the return of Alsace-Lorraine and the increased industrial activities, is estimated at 40,000,000 tons.

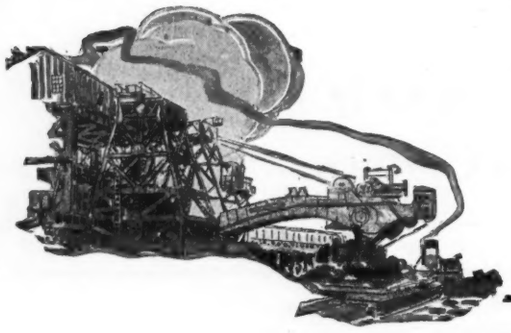
Relatively, France is in the same position as before the war in regard to iron and coal, having a superabundance of iron and insufficiency of coal; Germany, on the other hand, has a superabundance of coal and only a limited supply of iron ore. This shortage of coal on the part of France will necessitate the importation of large quantities of fuel and the exportation of iron ore.

Despite High Costs, Electrification of Swiss Railways Proceeds

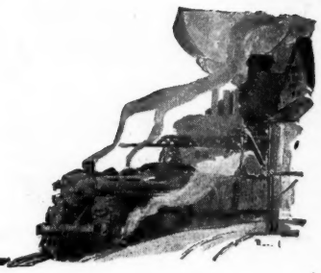
In spite of the present high cost of materials and labor, Trade Commissioner H. Lawrence Groves, Zurich, reports, the program for the electrification of the Swiss national railways is being pushed along as rapidly as possible, and Swiss firms are now holding contracts for the delivery of forty-odd electric locomotives within the next year. It is stated that the cost of one locomotive is about three times pre-war figures.

Poland's Coal Production Lags Behind That of 1913

Coal production in Poland in 1919, Trade Commissioner Louis E. Van Norman, Warsaw, reports amounted to 6,145,027 metric tons, as compared with 8,988,580 tons in 1913. Of the 1919 production, 4,614,710 tons came from the Dombrowa Basin, 1,408,983 tons from the Krakow region, and 121,334 tons from Silesia. Lignite was produced in the Zawiercie region to the amount of 173,798 tons in 1919, an increase of 18,716 tons over the 1913 figures.



Production and the Market



Weekly Review

Production of Bituminous and Anthracite Is Far Below Requirements, with No Relief in Sight —Orders Lacking in the West—Canada and New England in Severe Straits—Northwest Awaits Lake Shipments—Traffic Conditions Improve at Pittsburgh

NO RELIEF in sight is the report from all quarters. Production hovers around the 9,000,000-ton mark for bituminous and has not varied greatly from a 1,700,000-net ton figure per week for anthracite. This output is entirely too low for the needs of the country and demand continues to press and prices to remain high and indeed to mount in some fields. West of the Mississippi the summer buying movement has not begun and the mines are losing some time each week because of a lack of orders for coal. The loss is noteworthy only by comparison with the situation in the East. Compared with last year and with normal years, business is good even in the Far West.

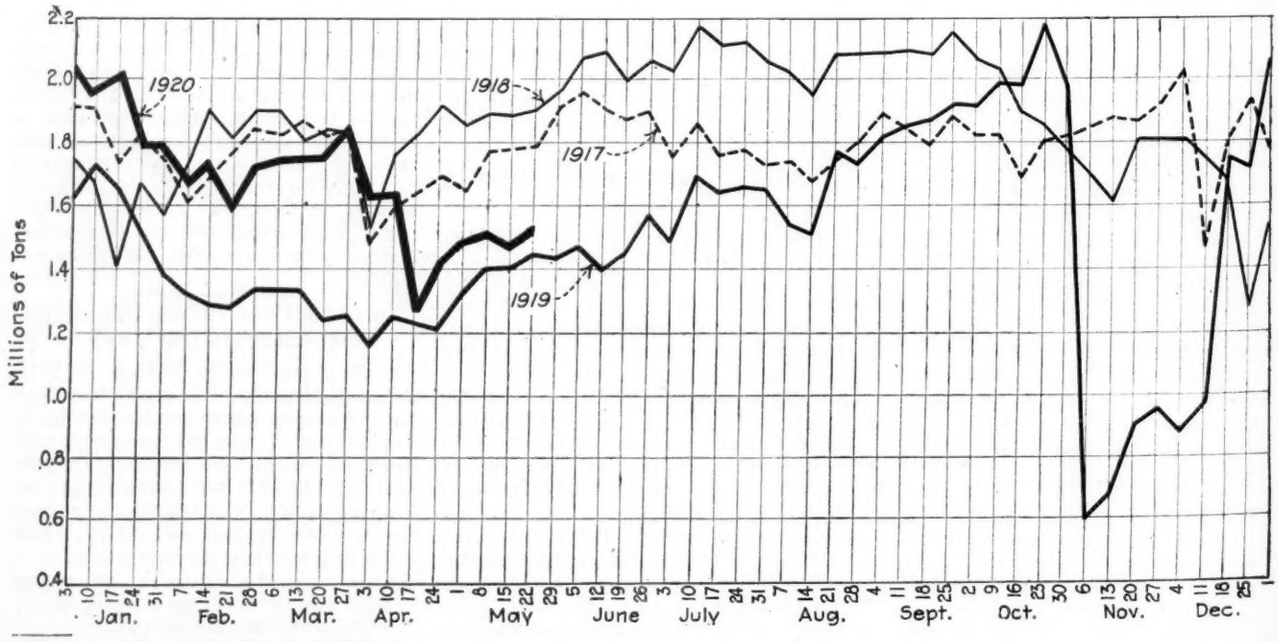
Canada and New England are in severe straits for lack of coal and the Northwest is marking time waiting for Lake shipments to get under way. Senators from New England have introduced measures in Congress to prohibit foreign exports of coal in order to insure a larger supply from the southern West Virginia fields.

Improvement in traffic conditions is reported from Pittsburgh, Connellsville, Cleveland and Chicago, but the measure of the improvement is not yet seen in more coal. Milwaukee has a fair supply of anthracite, but the lack of soft coal is described as little less than critical. From the smokeless fields the movement west has increased and thereby relieved a serious congestion at tide. Southwestern Virginia, where during the two years of war little or no trouble with car shortage was experienced, now is as hard hit as any other field.

Rising prices and labor dissatisfaction with the short running time are in evidence in the Middle West, and are noted particularly in the news from Cincinnati, St. Louis and Columbus. At Chicago so erratic is the steam market that poor grade coals are bringing higher prices than the best coal from the Southern field.

Anthracite is holding the interest of the trade, principally because of the wage controversy and the lack of certainty of prices for the season. The supply appears to be adequate for the demand, when it is realized that the demand this summer is unusually good for domestic coal. Shipments of anthracite on the Lakes are in better shape than are those of bituminous and New England is carrying on a brisk trade in hard coal, with no complaint of shortage in supplies.

Average Daily Production of Bituminous Coal*



*From weekly report of Geological Survey

Reports From the Market Centers

New England

BOSTON

Trade Apprehensive of Outcome — Traffic Situation Shows Only Slight Improvement — Hampton Roads Situation Unchanged — Panic Prices Prevail Among Speculators—Anthracite Trade Brisk — Price Discussion Gives New Note of Anxiety — Demand for Steam Sizes Uneven.

Bituminous—Several weeks ago it was felt that spot prices were on an unduly high level. For a time the export market was almost a controlling feature but that is no longer the case with the steam grades from Pennsylvania. It is active and insistent buying that has forced spot prices to their present high range.

Remedial measures by the railroad authorities so far seem only to reduce car-supply and to be generally restrictive. After a blue week of tight embargoes, effective for several days against all five New England gateways, the embargo against the Boston & Albany was cancelled on May 27. The New Haven embargo was lifted a day or two earlier, and it is now announced unofficially that the Boston & Maine embargo will probably be raised by June 1.

A great difficulty in New England is the lack of locomotives and the generally run down condition of equipment on most of the roads. Embargoes are certain to be intermittent during the summer.

The railroads are still seizing heavy tonnages. Buyers are getting restive over losing so much low-priced coal and being obliged to replace it at spot prices, with no good prospect of collecting the difference from the commandeering roads.

Movement to the Philadelphia and New York piers has decidedly improved. There are occasional sales at high prices, but the bulk of coal available is moving on contract, whether for foreign bottoms or for local use.

At Hampton Roads there seems no material change. Despatch is about normal for those who have the coal available; agencies that are short of prompt coal find it extremely difficult to make up cargoes. Sales of spot coal at prices around $13.50 have been reliably reported.

Current prices on bituminous at wholesale range about as follows:

	Cambrias and Somersets	Clearfields
F.o.b. mines, net tons	$7.00@$8 40	$6.25@$7.35
F.o.b. Philadelphia, gross tons	9.70@11.25	8.85@10.10
F.o.b. New York, gross tons	10.10@11.75	9.20@10.50

On cars Providence and Boston Pocahontas and New River are quoted from $11.00 @ $15 per gross ton.

Anthracite—The situation here continues to be a sellers' market. There is steady pressure to get all sizes down to pea. Even egg is in strong demand at this season, and retail dealers are not at all disposed to grumble over the assortments they receive. Movement by water is still in fair volume.

Tidewater

NEW YORK

Anthracite Situation Shows Slight Improvement—Demand for Domestic Coal Easier—Buckwheat in Heavy Call—Bituminous Moving Easier, but Prices Remain Strong.

Anthracite—A slight improvement is noticeable. Receipts are larger and the general situation shows a better feeling. One more announcement has been made showing additional increases in wholesale prices. The demand continues strong with no hesitancy in the market absorbing all the coal available.

Shipments from this market to New England by water continue slow because of harbor difficulties. Shippers report a strong demand from the north and west, but as the railroad difficulties continue, coal movements are slow.

The demand for the steam sizes goes on. weather conditions making no apparent change in the situation. Dealers are finding a ready market for all the buckwheat they can obtain. Rice and barley are also in good demand. Quotations for independent buckwheat ranged from $4 to $5 at the mine, rice $2.75 to $3 and barley $2 to $2.50.

Current quotations for company coal per gross ton at mine and f.o.b., tidewater, at lower ports, are as follows:

	Mine.	Tidewater.
Broken	$5.95@$7.50	$7.80@$9.35
Egg	6.35@ 7.35	8.20@ 9.20
Stove	6.60@ 7.70	8.45@ 9.55
Chestnut	6.70@ 7.70	8.55@ 9.55
Pea	5.30@ 5.75	7.05@ 7.50
Buckwheat No. 1	3.40@ 4.10	5.15@ 5.85
Rice	2.75@ 3.25	4.50@ 5.00
Barley	2.25@ 2.50	4.00@ 4.25
Boiler	2.50	4.25

Bituminous—With many factories in the Metropolitan district and throughout the territory covered by New York houses closing down, because of the lack of demand for their wares, conditions here are not to the entire liking of the trade. Demand is not as urgent as it has been and holders of coal contricts, while willing to take their requirements, are not as anxious to receive their tonnage as they were.

Due to the heavier receipts of contract coal at the piers and the delay in moving it because of labor difficulties, most of the piers here are affected by embargoes. So far the efforts of the Interstate Commerce Commission to relieve the jam have been of no avail, probably because the time has been too short.

Empty cars have been started for the mines, but the car supply remains at a low level at the works. Mines along the New York Central report a 46 per cent car supply, with about the same or slightly lower percentages reported along the Baltimore & Ohio and Pennsylvania lines.

Buyers continue to bid against each other and prices are higher than they were last week. Quotations on loaded boats at the piers range from $13.50 to $14. Quotations for the various pools ranged from $7 to $8 at the mines.

PHILADELPHIA

Anthracite Demand Strong for All Sizes—Stove and Nut in Heaviest Call — Strength in Steam Coals, Especially Buckwheat—Rice in Good Demand, but Barley Off — Bituminous Shows Slight Improvement—Strike at Tide Releases Coal for Domestic Trade.

Anthracite—With the weather approaching normal conditions, the retail dealers are devoting their entire energies to their summer deliveries. The dealers seem to be receiving fairly good shipments. But all producing companies are being urged daily for increased consignments.

The consumer demand is held close to stove and nut. The demand for egg, which has been increasing during the past few years, continues to be strong.

Pea coal is in stronger than the usual summer filling demand. Heavy shipments of pea are being received and most dealers are receiving more of this size than they are delivering.

As to prices now prevailing some of the independent shippers quote from $9.50 to $10 on egg, stove and nut. Usually the higher price is asked when the buyer refuses to take any pea coal; quotations on this size have run from $6.25 right up to $7.

There is a strong demand from the West to take coal at heavy premiums, as due to the slow delivery of coal to that region the people there are displaying considerable anxiety as to their ability to get sufficient fuel.

The steam sizes are in a strong position and no trouble whatever is experienced in getting $4.25 for buckwheat and plenty of sales are made at figures 25c. higher than that. Rice clings close to $3.25, but barley is occasionally shaded down to $2 and less and is the one size hard to move.

Bituminous—There seems to be some improvement in the bituminous situation. A number of producers report more cars received, but no one is getting anything in the way of cars to keep them going full time; most of the working time is around 50 per cent.

BALTIMORE

Soft-Coal Prices Moving Upward—But Drop in the Market Is Predicted—Hard-Coal Men Restive Under Price Uncertainty.

Bituminous—The price of soft coal keeps moving up in this section under active selling. Best coals sold at times readily as high as $8.25 and $8.50 f.o.b. mines the net ton, this price being recorded on sales of both steam and high-volatile gas coals.

The eight-dollar figure was quite frequent for almost any kind of coal under emergency purchasing. Probably the lowest prices recorded in this active market, for even the least desirable coals, was $7.25 f.o.b. mines the net ton.

It is predicted that the market is about due for a drop. The effect will not be immediate, as a number of consumers still need coal, but the accumulation, along with a betterment in the car run generally is expected to have the effect of breaking down prices somewhat from the exceptionally high standard.

At this writing there is a large number of ships here, there being 37 at the Curtis Bay piers or astream off the piers, for a total of about 205,000 tons of coal; and five or six at Canton or off the Pennsylvania pier for some 35,000 tons. At Curtis Bay to meet this there are 1,800 cars of coal and at Canton about 750 cars; the daily dumpings at the Baltimore & Ohio showing a healthy increase lately, running between 400 and 500 cars, while the Pennsylvania is dumping about 125 cars a day.

Anthracite—Hard-coal men here are growing restive under the delay in settling the wholesale prices because of the slow work of the Washington wage conference. Many of them report that the prices now charged at wholesale are far in excess of the retail advance of one dollar, which was set above the old October schedule as a temporary stopgap. Consumers too are restive under the fact that they cannot get a definite word on what their coal will cost them when delivered.

Lake

BUFFALO

Car Supply Controls Coal Situation—Bituminous Prices Chaotic—Shortage of Steamboat Fuel—Anthracite More Plentiful—Lake Shipments Good—Coke Quotations Irregular.

If a fairly good car supply could be obtained the situation would improve at once. Many Eastern coal cars have been observed on the Pacific Coast and Federal relocation orders have been issued for their return.

Bituminous prices are in a chaotic state, shippers as a rule refusing to make any quotations. If there is no contract the consumer is likely to pay from $6 to $8 at the mines, but with a good car movement these prices would disappear in short order.

The worst feature here is the shortage of steamboat fuel. It seems to be difficult to get any and yet one coal-shipping line has fuel enough and sells it at $6.50.

Anthracite.—There is complaint of scarcity in the city still, but the supply is much more adequate than is the case with bituminous. Consumers all tried to get a supply before the prices advanced. It should be remembered that it was the summer buying that saved the situation last winter.

Lake shipments are good, though the late start will count against the totals. All the upper-lake ports of account have been covered but they still have little coal. It is not expected that the shipping companies can make much of a showing under present conditions.

It has been impossible so far to fix Lake-coal freight rates; some cargoes paid 50c. to leading Lake Superior ports; 65 to 70c. to Chicago; 60c. to Milwaukee and 55c. to Sheboygan. Shipments for the week were 75,000 net tons, of which 37,400 tons cleared for Duluth-Superior, 18,600 tons to Milwaukee, 13,000 tons to Chicago, 4,000 tons to Detroit and 2,000 tons to Sheboygan.

Coke—The coke trade is fast following bituminous coal and prices are most anything that the shippers demand. Jobbers are not quoting it regularly, merely saying that it costs them as high as $20 at the ovens for both foundry and furnace, with other sizes and grades not in the market. To this must be added the Buffalo freight rate of $2.60.

CLEVELAND

Bituminous Situation Improving, But There Is Little Spot Coal—Pocahontas and Anthracite Unchanged—Pooling Arrangement Planned for Lakes.

Bituminous—Receipts of coal are gradually improving, but the movement is still far below normal. Empty cars for the coal mines are beginning to arrive from the West, in response to the Interstate Commerce Commission's relocating order, and marked improvement is expected soon in mine operation and receipts of coal.

Operators with headquarters in this city report that they are bending all their energies to take care of the Lake needs and their regular contracts, with the result that spot coal is almost unobtainable. For the little available prices are wild, as high as $6 a ton having been the figure for some sales of small tonnages this week.

Labor troubles on the Baltimore & Ohio are retarding operations in the No. 8 district, but there has been some freight improvement on the Pennsylvania lines. Retail dealers remain short of stocks but most plants are being kept in operation. Prices are strong.

Pocahontas and Anthracite—Quotations for Pocahontas and anthracite, which increased last week, remain unchanged. Receipts continue abnormal and the demand from domestic consumers is heavy.

Lake Trade—There is an effort to effect a pooling arrangement to prevent a fuel famine in the Northwest. Last week the coal shippers agreed to the plan to be placed in operation under the 1918 regulations. A meeting with ore and vessel men disclosed opposition from those sources, however.

Large ore interests are especially opposed to the plan. Herman M. Griggs, chairman of the Ore & Coal Exchange, is preparing a statement of the facts to be presented to the Interstate Commerce Commission. The railroads have agreed to the plan. Receipts at Lake ports are better, and Lake freight business is now said to be about 75 per cent of normal.

Retail prices of coal per net ton delivered by dealers in Cleveland are:

Anthracite—egg, $13.20; grate, $13.20 @$13.50; chestnut $13.50; stove, $13.50.

Pocahontas—shoveled lump, $11.75; mine-run, $9.25.

Domestic bituminous — West Virginia splint, $9.50; No. 8 Pittsburgh, $7.75; Millfield lump, $9.10; and cannel lump, $11.50.

Steam coal—No. 6 and No. 8 slack, $8.60; No. 6 and No. 8 mine-run, $8.60; No. 8 3-in. lump, $8.60.

MILWAUKEE

Soft-Coal Situation Critical—Crisis If Receipts Fall Away—Fair Supply of Anthracite on Hand—No Change in Prices.

The soft-coal situation at Milwaukee continues critical. Receipts continue sufficient to keep all industries moving, but unless they are speeded up and maintained at a good volume the fuel supply of the city will be exhausted before winter sets in. Should receipts fall away the crisis will be reached during the summer.

Milwaukee needs to have fully 3,000,000 tons of coal on the docks at the close of navigation. This requires a steady flow of cargoes, and receipts by Lake thus far have been quite disappointing. There is a fair supply of anthracite for the season and deliveries are being steadily made. The demand could be improved upon, however. Consumers do not take kindly to present prices, with summer weather prevailing.

Gas coal seems particularly scarce, and several companies in interior cities face complete suspension of operations. Some are carbonizing ordinary grades of coal at the expense of an inferior quality of gas.

No change has been made in the schedule of prices on hard and soft coal, but an advance all around is expected before long. Receipts of coal thus far this season include 105,452 tons of anthracite and 131,458 tons of soft coal, against 158,538 tons of the former and 560,750 tons of the latter in 1919. Complaints of too high a price in some instances have been heard.

Inland West

DETROIT

Coal-Carrying Roads Embargo Michigan — Situation Most Serious — Anthracite Outlook Also Bad—Little Lake Improvement.

Bituminous—Bituminous coal is coming into Detroit in small amount only, and yet a further reduction of shipments into the state is threatened. It is stated that the Hocking Valley, Pennsylvania and Toledo & Ohio Central railroads have given orders that their coal cars be kept out of Michigan. This action is said to mean that fully half the coal handled over those roads will be held in Toledo.

Michigan used to get 75 per cent of its coal from West Virginia and Kentucky, according to a Detroit wholesaler, but since the war opened, that coal has been diverted to the sea coast and Detroit has to depend on Ohio to make up the deficit. If the railroads that carry most of this Ohio coal forbid the movement of their cars into Michigan, it will be most serious for Detroit.

Except for the coal from Ohio, Detroit's supply is limited quite closely to small shipments from Illinois and Indiana. Prices on Ohio coal are quoted as $5 to $5.25 at the mines for lump in short tons, $4.75 to $5 for mine-run and $4.75 for slack.

Anthracite—The situation in the anthracite trade is causing considerable apprehension to dealers as well as consumers. Little anthracite is being brought into the city and practically no supply remains in the yards. The dealers not only have no coal to deliver but are also without information as to prices.

Lake Trade—While coal is reported moving somewhat more freely to some of the Lake loading docks, there is little improvement at other points. Lake vessels are still having great difficulty in obtaining fuel in sufficient quantity to meet their needs and in many instances vessels have to be shifted from port to port to get coal.

ST. LOUIS

In General Conditions Grow Worse—Car Shortage Shows No Improvement — Prices Higher Than Ever Before at This Season—Miners Dissatisfied—Future Does Not Look Good.

In St. Louis proper steam coal seems to be the cause of much concern. Many plants are unable to get any. Coal is not available for shipment from the mines because outside markets are offering unheard-of prices.

In the past few days screenings have been going at from $5@$5.25. But the demand for railroad coal in mine-run form has taken a large tonnage of screenings off the market.

The domestic demand is good, in both city and country, with little coal to be had. The price of Standard coal makes it prohibitive. Mt. Olive is coming in for one-tenth of the demand, with little Carterville.

Standard lump, egg and nut, are bringing from $3 to $4; $4.25 in the city and as high as $5 outside. Screenings are bringing anywhere from $3 to $5. Mt. Olive prices on domestic sizes range from $2.75@$4, while Carterville domestic sizes are from $3.50@$4.25, with as high as $4.50 and $5 asked.

In the Standard district some mines are working one day a week. Others loading railroad coal get as many as four days. In the Mt. Olive field similar conditions exist and there is much dissatisfaction among the miners.

In the Carterville field the mines work about two days a week on commercial coal.

On the Missouri Pacific lines almost no commercial coal is being loaded, the railroad demanding everything for its own use and still trying to force operators to sell coal at the railroad's price or go without equipment.

The retail prices in St. Louis have advanced as follows: Carterville, $7.50; Mt. Olive, $6@$6.25; Standard, $5.50@$6. Anthracite, grate and egg, $14.20; stove and chestnut, $14.45. West Virginia smokeless, $11.50@$11.75. By-product coke, $12.50. No gas house coke is available.

COLUMBUS

Active Bidding Advances Prices — Reduced Car Supply Curtails Production — Steam Market Hard Hit — Domestic Trade Lively — Lake Business Still Slow.

The striking feature of the coal trade in Ohio is the active bidding which has caused higher prices in all producing fields. Michigan and northern Ohio consumers have buyers in the Hocking Valley and Pomeroy Bend fields bidding for available tonnage, and extra high prices are offered.

Mine-run and slack is sold between $5 and $6 per ton at the mines and in some instances prices are higher. Mine-run appears to be higher than lump. With the output still curtailed to about 40 or 45 per cent of normal, it would not be surprising to see still higher prices.

The steam market is by far the most important department of trade. Northern Ohio and Michigan points are hard hit, while those in central Ohio have been able to make out with what fuel they could obtain. Reserve stocks are entirely exhausted, and most of the plants and utilities are operating from hand to mouth.

The domestic trade is also lively, but the strength exhibited in steam circles is lacking here. Retailers are clamoring for shipments. Retail stocks are low. Some West Virginia splints are arriving, but Pocahontas is scarce and little is coming west. Hocking and Pomeroy grades constitute the larger part of the supply for domestic purposes.

The Lake trade is still slow. The reduced production and rail embargoes have worked against Lake shipments. Records show only about one-fifteenth of the tonnage moved to the Northwest, in comparison with a year ago.

Prices at the mines for coals used in central Ohio are:

Hocking lump	$5.00 to $5.75
Hocking mine-run	5.00 to 6.00
Hocking screenings	5.00 to 6.00
Pomeroy lump	5.25 to 6.25
Pomeroy mine-run	5.00 to 6.00
Pomeroy screenings	5.00 to 6.00
West Virginia splints, lump	6.00 to 6.50
West Virginia mine-run	6.00 to 6.50
West Virginia screenings	6.00 to 6.50
Pocahontas lump	7.00 to 7.50
Pocahontas mine-run	6.50 to 7.00
Pocahontas screenings	6.50 to 7.00

CINCINNATI

Operators' Difficulties Righted Only by Better Transportation—Little Progress Made in Lake Situation — Embargoes Increase Coal Prices.

The big factor in the local coal situation is that of transportation. Labor can take care of the conditions as they are today, but there seems to be no relief in sight until the transportation difficulties begin to right themselves. The coal men say there is only a 30 per cent car supply.

In speaking of coal for Lake shipment, the operators say that already three good months of production and two good months of Lake delivery have passed, with little progress made in filling the current demand, to say nothing of piling up a reserve.

Prices in this district have taken a jump. Contract delivery is the only one desired. Auction sales of coal are always taken at prices that never before were dreamed of here.

The Louisville & Nashville has placed an embargo, refusing to accept shipments off its own lines, explaining that as soon as its cars return in fairly good supply, the embargo will be lifted.

The Norfolk & Western has placed an embargo, east and west, off its lines.

In view of the embargoes, Ohio coal is reaching the suburban industrial plants, but it has been increased in price at both mines and plants. It is hoped that orders given to rush cars to the L. & N. and N. & W. will cause the embargoes to be lifted.

The shipments down the Ohio River, as always, are aiding in relieving the local situation. Retailers report that demand from domestic consumers continues brisk.

Wholesale prices are as follows, f.o.b. mines: West Virginia, block, $4.50; run-of-mine, $4; slack, $3.75@$4.

Jobbers have jumped their prices up to $6.50, $7 and in some instances as high as $8. Gas and byproduct coal in the past week have been increased to $6.50 and $7.50 and steam mine-run to $6.50 to $7. These prices cover the Kentucky side of the question also, with 25c. to 50c. better for domestic.

Retail prices of soft coal, delivered, are as follows: Lump, $8 to $8.25; nut, $6.75 to $7.25; run-of-mine $6.50 to $7. Smokeless, lump, $9.25; run-of-mine, $8.50. Anthracite, $14.

CHICAGO

High Prices with Demand Strong — Poor-Grade Coal Sells at Fancy Prices—Little Relief from Car-Pooling Plan Yet—Expect Improvement Soon—Some Anthracite Arrives, but Little Bituminous Comes from W. Va.

The Chicago coal market is steadily going up and high prices may be obtained for all kinds of spot coal no matter how poor in quality or preparation. The coal buying impulse which siezed the public 60 or 90 days ago is showing no signs of abatement, but on the contrary the markets here are flooded with frenzied buyers, or would be buyers, of coal.

Paradoxical as it may seem, poor-grade coals are selling at from one to two dollars per ton more than the higher grade and better prepared coals from the Franklin, Williamson, or Saline counties. There is, however, a noticeable and growing tendency on the part of a great many operators to disregard the circular prices which were sent out to the trade April 1.

A restoration of the car-pooling plan by the Interstate Commerce Commission has to date brought no improvement, but whether or not the car supply at mines in Illinois and Indiana will improve, is a question which will have to be decided by developments during the next three or four weeks.

The freight embargoes and delays which were the direct result of the switchmen's strike are now not as unsettled as they were a few weeks ago, although conditions are far from normal at the present time.

The various holding yards in and about Chicago are now in fairly good shape and it is hoped that from now on there will be a decided improvement. It is said that coal-carrying equipment is being returned to originating lines in larger numbers and at a greater speed than at any time during the past four or five weeks.

With the exception of anthracite, little eastern coal is coming into Chicago and anthracite shipments are nowhere near normal. There is a divergence of $1.25 per ton between quotations made by the various operating companies who produce and sell hard coal in this city. All of these people are not taking on new business but are concentrating their efforts in taking care of the demands of their established trade.

Relative to bituminous coal from the east, it is generally believed that Chicago cannot compete with tidewater on West Virginia splint and smokeless coals. Consequently but little soft coal is coming in from the east.

A careful investigation into the retail situation shows that a great many Chicago coal yards now have a fairly adequate supply of soft coal on hand and are therefore able to take care of their trade to some extent.

The householder is still quite panicky about his coal and is buying his winter's supply to be delivered into his cellar during the summer months. Even if the operating districts of Indiana and Illinois receive an excellent car supply, it will take at least from 30 to 60 days for the market to reach an easy state.

South

BIRMINGHAM

Steam-Fuel Supply Low and Demand Strong — Domestic Coal Also Scarce — Transportation but Slightly Improved.

There is practically none of the higher grade steam coals to be had in this district at the present time, and only quite a limited tonnage of Big Seam and other low and medium grades available for the spot market and there is strong competition for every ton offered, Big Seam mine-run being good for $4.25 to $5 per net ton mines.

However, a run-away market will not likely develop, since the amount of surplus coal is so negligible, the principal operators having sold ahead a much larger tonnage than they are able to produce under existing conditions and their entire output is being applied against orders in hand, at a reasonable margin of profit.

Domestic coal is also scarce but is not featured by as strong a demand as steam, though there is not sufficient tonnage to meet the needs of the trade. Deliveries on contracts are being made rather slowly but retailers are making some progress in stocking.

The car supply on the Southern Ry. has been slightly better for the past few days, and there has been less coal confiscated by this line than during the first part of the week. Piper, Marvel, Garnsey, Coleaner and other mines in the Cahaba field continue on strike and this has increased somewhat the number of cars apportioned to the mines in operation.

The car supply on the Louisville & Nashville is reported as poor while the Frisco road has furnished a fair quota, but materially short of the number needed. Mine labor is working in a rather lax and indifferent manner, though there is no labor unrest except at a few small operations.

LOUISVILLE

Prices Climbing Steadily Due to Heavy Steam Demand—Few Mines Screening Coal — Local Supplies Light — Higher Prices Predicted.

A runaway market barely expresses the way in which all bituminous fuels are climbing upward in the Kentucky fields today. The demand for steam grades is so keen that few operators are screening coal, preferring to ship mine-run. This results in a big shortage of screenings for plants equipped with mechanical stokers, and small deliveries of block coal to retailers.

Local supplies are quite light and very little coal is being bought by retailers under existing conditions, and many retailers are advising consumers to wait.

Coals of the Harlan grade are selling at a premium for gas and steel mill use, the fair price being from $6 to $7 a ton, while run-of-mine, on a premium basis, is selling at $7.25@$7.50 a ton at mine.

Hazard and some other coals are selling at $6 a ton and up for mine-run, and meeting with a steady demand. Prices of Alabama and Southern coals are well in line with Kentucky and East Tennessee fuels, and such coals are selling freely in the South.

Price advances have been more severe in the Western Kentucky field than elsewhere, due to the heavy buying forcing up the market.

Western Kentucky mine-run is today quoted at prices around $4.50@4.75 a ton, and block is quoted at as high as $5.50 a ton. It is believed that Western Kentucky will shortly be selling mine-run at $6@$6.50 a ton if conditions continue.

There has been some slight improvement in car supply, and mines in some districts are operating at 40 per cent capacity or better.

Retail prices in Louisville have again advanced 40c. a ton. River coal is retailing at around $9 a ton; and Eastern Kentucky rail coal is selling at $9.25@$9.50 for block in most retail offices. Western Kentucky block is selling at $7.50 a ton retail.

The following are quotations for Eastern Kentucky: Block, $6.50 to $7.50 a ton at mine; mine-run, $6; nut and slack, $6 and up. Western Kentucky prices are: Block, $5.50 and up; mine-run, $4.50 and up; nut and slack, $3.50 and up.

Canada

TORONTO

Great Shortage of Coal, Owing to Freight Charges — Matter Reported Settled.

The coal situation has been practically unchanged for the last two weeks, importations by rail having almost completely ceased, owing to the difficulty over the payment of freight to Canadian destination in New York funds.

Many carloads of coal originally billed for Toronto have been re-consigned to American points, owing to the refusal of local dealers to pay the increased freight charge. It is stated that a settlement of the difficulty has been arrived at and that coal will be coming forward freely in a day or two.

Some small supplies of anthracite are being received by water. Bituminous is quite scarce, and many industrial plants have reduced their force or are running on short time.

Quotations for short tons are as follows: Retail—anthracite egg, stove, nut and grate, $14; pea, $12.50; bituminous steam (nominal), $11; domestic lump (nominal), $12.50; cannel (nominal), $14.

News From the Coal Fields

Northern Appalachian

FAIRMONT

Pronounced Car Shortage in Northern W. Va. — Congestion at Brownsville, Pa., Somewhat Reduced — Operators Incensed at Assigned-Car Practice.

There was a pronounced shortage of cars throughout northern West Virginia during the third week of May as a result of which in the Fairmont region, for instance, there were not less than 60 mines idle on any one day, the shortage in cars continuing to average more than 50 per cent.

Operations along the Monongahela R.R., in both Marion and Monongalia counties, were as short of empties as in all other parts of northern West Virginia.

The congestion at Brownsville, Pa., was reduced to some extent by efforts of the Pennsylvania railroad, but the Pittsburgh & Lake Erie found it impcssible to move a single car of coal from Brownsville, as had been the case for several weeks. The Interstate Commerce Commission has not afforded any practical relief as yet.

Neither Lorain (a Lake point) nor Curtis Bay, at tidewater were under embargo during the third week of May. But both Lake and Inland West shipments were extremely light in volume considering the demand.

The assigned-car privilege has been so greatly abused in northern West Virginia that the Northern West Virginia Association has decided to take the matter into the Federal Courts and to the Interstate Commerce Commission unless action is taken by the National Coal Association at Atlantic City.

PITTSBURGH

Traffic Conditions Slowly Improving — Bessemer Road Operating Again — Fancy Prices Offered for the Small Spot Tonnage.

In the past week there has been a distinct, though slight, increase in the movement of Pittsburgh district coal. Almost the best that can be said of the situation is that the trend is in the right direction, but hopes are entertained that a really measurable improvement will soon occur. Operations may still be estimated at about 25 per cent of normal for the mines depending entirely on rail shipments, while those with river connections are working to the limit of the shipping facilities.

The improvement in movement noted thus far is chiefly in connection with private cars, the supply of railroad-company cars not having increased materially. Coal operators believe the orders of the Interstate Commerce Commission as to diversion or return of empty coal cars, if complied with promptly, would bring about a great improvement, but have doubts whether the compliance will be very prompt. Operators assert that railroads have a way of discovering obstacles when it suits their convenience to do so.

The Bessemer & Lake Erie R.R. has been functioning normally since about May 20, and coal production on that line is now fairly heavy again. This has enabled the Republic Iron & Steel Co., at Youngstown, which has mines on the line, to resume nearly full operation.

CONNELLSVILLE

Transportation in the Region Improves — Production May Now Be 75 Per Cent—Fancy Spot Prices Continue.

Car supplies in the Connellsville region have been improving more or less steadily for nearly a fortnight. The Pennsylvania and Baltimore & Ohio are functioning still better, while the Pittsburgh & Lake Erie is now doing something, although not a great deal.

The Monongahela R.R. taps a large part of the productive capacity of the region, and is operated jointly by the P. & L. E. and the Pennsylvania—each road being supposed to contribute half the cars. On an average in normal times the P. & L. E. has supplied about two-thirds, while during the strike until quite recently it has supplied practically none.

For the first six weeks, during which the rail strike affected the Connellsville region, the coke production was at about 65 per cent of the rate obtaining before the strike; but with the recent improvement, this week should show 75 per cent or more of the former rate.

The movement of coke (once loaded) is improved, and as the amount of coke en route decreases, then the receipts at furnaces exceed the shipments from ovens. One large valley interest found that for some time it had en route to its furnaces just three times the normal quantity of coke.

There is practically no contract market, neither consumers nor producers caring to negotiate when conditions are so uncertain. The spot market is quite a narrow affair. The offerings are small, nearly all the coke made being by producers or by merchant ovens having regular contracts. The disposition of consumers to buy is also limited, many consumers simply refusing to pay the fancy prices now obtaining.

However, there is enough absorption to prevent a decline, and in open market transactions $15 per net ton at ovens is practically the market for both furnace and foundry coke. Some transactions in furnace coke between friends are probably put through at lower prices; while two or three important foundry-coke producers are holding their price down to $12 and making sales only to regular customers.

The *Courier* reports production in the Connellsville and Lower Connellsville region, in the week ended May 22, at 178,250 tons, an increase of 23,850 tons.

Estimates of Production

FROM THE WEEKLY REPORT OF THE GEOLOGICAL SURVEY

BITUMINOUS COAL

	1920 Week	1920 Calendar Year to Date	1919 (a) Week	1919 (a) Calendar Year to Date
May 8b	9,167,000	184,348,000	8,438,000	149,979,060
Daily average	1,528,000	1,671,000	1,406,000	1,352,000
May 15b	8,756,000	193,104,000	8,436,000	158,415,000
Daily average	1,459,000	1,660,000	1,406,000	1,362,000
May 22c	9,174,000	202,277,000	8,724,000	167,139,000
Daily average	1,529,000	1,655,000	1,454,000	1,367,000

ANTHRACITE

	1920 Week	1920 Calendar Year to Date	1919(a) Week	1919(a) Calendar Year to Date
May 8	1,840,000	29,531,000	1,777,000	26,917,000
May 15	1,726,000	31,256,000	1,761,000	28,678,000
May 22b	1,788,000	33,044,000	1,673,000	30,351,000

BEEHIVE COKE

United States Total

Week Ended May 22 1920b	Week Ended May 15 1920	Week Ended May 24 1919	1920 to Date	1919 to Date a
378,000	349,000	251,000	8,471,000	8,126,000

(a) Less one day's production during New Year's week to equalize number of days covered for the two years. (b) Revised from last report. (c) Subject to revision. All figures in net tons.

CHESAPEAKE & OHIO

Operators Act to Secure Better Service from C. & O.—President Stevens Comments on Situation.

About 75 operators representing the Kanawha, New River, Coal River, Guyan and Big Sandy fields of West Virginia gathered in Huntington recently to take appropriate action to secure service commensurate with their needs. It was decided to go into the courts if necessary in order to compel the Chesapeake & Ohio R.R. to furnish enough equipment. The sum of $400,000 was pledged to back up the efforts of the coal people to secure better transportation service and a committee of five was selected to perfect arrangements for carrying the plans of the operators into effect. No representatives of the Chesapeake & Ohio were present at the meeting, but George W. Stevens, president of the road, while in Huntington, at a later date, said: "The Chesapeake & Ohio is doing all that it possibly can do to relieve the car shortage on its lines. Our road has ample equipment to care for the needs of all of its shippers if the cars were returned to us promptly. All control over our rolling stock is lost as soon as the cars leave our rails, and there are no means at our disposal to secure their return." Mr. Stevens also said negotiations were now under way for the purchase of 1,000 100-ton coal cars to be used exclusively in handling coal for tidewater.

NORTHERN PAN HANDLE

Majority of Mines Idle Here and in Eastern Ohio—No Cars—River Transportation Helps Out Industries—Railroad-Fuel Mines Work.

Between May 10 and May 22 the car shortage in the Northern Pan Handle of West Virginia, or Wheeling district, was so acute that fully 60 or 70 per cent of the mines here were idle two-thirds of the time.

Instead of the situation showing improvement, at the beginning of the last week of the month it grew worse owing to the strike of switchmen and yardmen at the Holloway yards of the Baltimore & Ohio, near Bridgeport, Ohio, that being the road's northern gateway to the Lakes.

While through trains were moved, it became necessary to impose embargoes on all shipments requiring switching at the yard named. The only thing that prevented greater idleness to industry was the fact that river transportation of coal was possible.

The greater part of the supply of empties available was assigned to such mines as had contracts to furnish railroad fuel. In some instances mines were accepting railroad-fuel contracts to keep their mines in operation. The assigned-car system is said to be used as a club here as elsewhere to force coal companies to supply fuel to the railroads at prices fixed by the latter.

Mines in the eastern Ohio regions were loading only a small part of potential capacity owing to poor transportation conditions.

Middle Appalachian

POCAHONTAS AND TUG RIVER

Car Shortage Acute, Reducing Production Below 50 Per Cent — Western Shipments of Smokeless Increase and Relieve Tidewater Piers — Tug River Output Cut to the Quick.

While labor troubles affected production in the Thacker field during the weekly working period ended May 22, owing to the tragedy at Matewan, as well as to a political campaign of unusual bitterness, yet the lean production in other Norfolk & Western fields was due to a continued acute car shortage and to the derangement of the sources of car supply in the West. Reports from all smokeless fields supplied by the Norfolk & Western showed that car shortage and other causes reduced production to a point below 50 per cent of potential capacity.

The only new development in Norfolk & Western smokeless fields was an increase in Western shipments due to a desire to avoid overcrowding tidewater piers with more coal, the heavy movement to tide during previous weeks having brought about much congestion there. There was much talk of the prospects of having to utilize privately-owned cars in order to augment tidewater shipments. In the Pocahontas field the loss from a car shortage was in the neighborhood of 300,000 tons, as against which only about 240,000 tons were produced, other sources of loss being comparatively negligible. Heavier shipments were made to western points for the reasons previously noted.

Tug River production was still on a discouragingly low level. As most of the cars for this field had to be distributed from such a supply as was received from tidewater, the total number of cars available when pro-rated among the very mines cut the supply almost to the quick.

VIRGINIA

Shortage of Equipment Retards Output One-Third—Large Tidewater Tonnage at High Prices.

Inability to secure an adequate supply of cars was still materially holding back production in the Virginia fields for the week ended May 22, the output reaching only 119,000 tons, aside from the 43,000 tons coked in ovens.

There were no losses to speak of from any shortage of labor, which was considered equal to a large production, but a shortage of equipment, applying to the entire region, did retard the output to the extent of about one-third of the capacity of the mines.

The mines served by the Clinchfield R.R., however, sustained even heavier losses, leaving a shortage of cars running as high as 56 per cent.

The bulk of production was still being shipped from Virginia fields to tidewater, spot prices for such coal being on quite a high level, owing to the comparatively limited supply. Coke was bringing from $12 to $14, the former price being quoted for furnace and the latter for foundry coke. The price for mine-run at the mines was ranging from $5 a ton upward.

KANAWHA

Car Supply Better on K. & M. Than on C. & O.—Kanawha Coal Goes to Tide—Difficult to Obtain Empties from the West.

During the first half of the week ended May 22 in the Kanawha region, transportation conditions showed a slight improvement over the preceding week, but production during the last half did not average over 15,000 tons a day at mines on the Chesapeake & Ohio.

However there was a somewhat more marked improvement on Coal River. The Kanawha & Michigan at the same time kept its mines fairly well supplied with empties, the quota fluctuating from 38 to 82 per cent.

There was a steady pressure for coal for delivery at the Lakes, but buyers were unable to secure any tonnage to amount to anything for delivery at such points, Kanawha producers shipping the larger part of their product to tidewater, where somewhat higher prices prevailed.

The fact also that it was difficult to secure the return of empties from Western markets, seemed to deter producers to some extent in consigning coal to the West. Assigned cars continued of course to reduce the supply of empties available for the loading of commercial fuel.

NEW RIVER

Mines Operate Two Days in Third Week of May—Shipments to West and to Lakes Low—Strike on Virginian Ry. Stagnates Production in the Gulf.

Lack of cars reduced mines to a critical condition in the New River field in the week ended May 22, many mines operating only about 15 hours during the weekly period. The entire output for the field for the week was not over 100,000 tons, running approximately 25,000 tons behind the output for the period ended May 15.

As had been the case in earlier weeks, the tonnage moving westward was low in volume, coke alone being consigned to Western points to any extent. It was not attempted to ship much coal from the field westward, owing to the fact that so few cars were being received from Western points. For the same reason Lake shipments were virtually negligible.

A strike of shopmen and car inspectors at Princeton, in which 1,200 men were involved, had the effect of almost completely stagnating production at mines on the Virginian Ry. in the Winding Gulf field, the railroad being unable to furnish any considerable run of empties throughout the week. Another factor in holding down production on the Virginian, was the great accumulation of cars at Sewell's Point.

NORTHEAST KENTUCKY

Decrease in Output Fault of Louisville & Nashville—Heavier Tonnage to the Lakes, Inland West and North.

Ground was lost in the Northeast Kentucky field during the deek ended May 22, as compared with the previous week, only 118,960 tons being produced as against 122,000 tons for the previous week, full time capacity being 291,760 tons. The greater part of the loss of output was attributable to a shortage of cars chiefly on the Louisville & Nashville R.R., the supply on that line being nearly ten per cent under that of the previous week.

On the other hand mines on the Chesapeake & Ohio managed to secure about as many cars as they had during the previous week, or approximately 44 per cent of requirements. The mines on the Louisville & Nashville had a supply of only 32 per cent. There was little to warrant the belief that there would be any material improvement in transportation.

There was quite a perceptible increase in the movement of coal to the Lakes as compared with previous weeks. It was also believed that more coal was being shipped to Inland West points and to the North.

LOGAN

Production Losses Heavy, Due to Car Shortage—Much of Logan Output Goes to Tide—More Than Half of C. & O. Coal Cars on Other Lines.

As during the previous week, production losses were quite heavy in the Logan field during the week ended May 22, mounting well above 250,000 tons; while on the other hand the output remained at the same figure as that of the previous week. Logan district mines could not produce more coal on account of lack of cars. While for the first two weeks of the month there had been about a 45 per cent car supply, during the week ended May 22 the supply was on even a lower level.

The larger part of the output of the Logan field was being shipped to tidewater, still under special permit, however. Producers generally were not consigning a very large tonnage either to Lake points or to Western markets, one reason being the inability to secure the prompt return of empties.

While labor-shortage losses were on a somewhat larger scale than heretofore owing to friction between miners and operators over the organization of the Williamson field, nevertheless not more than six mines in the entire field were shut down during the third week of May because of labor trouble, the mines chiefly affected being those in the vicinity of Matewan.

Car shortage losses far exceeded those from labor shortage, the former entailing a loss in production of about 100,000 tons, or approximately 45 per cent; labor shortage losses, on the other hand, equalled only about ten per cent of potential output.

Shipments to the Lakes this year are estimated to be about 1,500,000 tons short for the present lake season, insofar as the Chesapeake & Ohio R.R. is concerned. Officials of that system point out that the haul is short and the road is able to control the movement to the Lakes and back to the mines. However, less than 20,000 of the 42,000 coal cars belonging to this railroad are now on that company's lines.

Southern Appalachian

SOUTHEAST KENTUCKY

Activity in Coal-Land Sales — Big Deals Reported — Byproduct Concerns Interested.

Several transfers of coal properties have recently been made in this field. Owing to the suitability of the coal in this region for byproduct purposes, a number of large gas companies have been acquiring properities. Among these are the following: Coal lands owned by T. J. Asher, known as the Lick Branch property, leased and operated through the Harlan Coal Co. and Williams Bros., to the Koppers Coal Co. of Pittsburgh, Pa., for a consideration said to be around $1,500,000. It is reported these people will make extensive development of this property, putting in their own railroad equipment, and so on. The McComb Coal Co., near Harlan, sold its holdings to the Detroit Gas Co., at a figure understood to be $800,000. The Kentucky King mine, in the Harlan district, has been reported sold at $600,000.

Middle Western

INDIANA

Great Scarcity of Fuel—Car Shortage on Account of Embargoes—Domestic Demand Due to Cold Weather.

Demands for steam coal by industries, public utilities and railroads upon the operators of Indiana are only matched by the demands for domestic coal. Railroads are not getting a sufficient tonnage. Public utilities and industries all over the state are shutting down entirely because of lack of coal.

The principal cause is the car shortage. Indiana operators looked for embargoes to be lifted, but conditions appear to be no more favorable than they were a week ago. It is practically impossible for an Indiana operator to get a car of coal out of the state or to get an empty in.

Cold weather during April and May caused a steady demand for coal for domestic use. In many of the smaller cities, which have never fully recovered from the strike of last November, suffering was reported.

The prevailing price per ton for screenings for steam coal is $2.75; mine-run, $3; lump, $3.50. Indiana egg and nut are sold at retail at $7.50 a ton and mine-run from $6.75 to $7 a ton.

SOUTHERN ILLINOIS

Office Building for Coal and Railroad Interests—Byproducts Coal Co. Fire—Development of Extensive Coal Lands by New Railroad.

Jesse Dimond, of Chicago, president of the Southern Gem Coal Corporation, which operates several mines in Franklin County, Ill., is said to be contemplating the erection of a five-story building to cover an entire block in Mount Vernon, Jefferson County, Ill. The building will contain the offices and headquarters of the Wabash, Chester & Western R. R., recently purchased by this company, together with the offices of the Dimond coal interests.

An explosion of oil in a transformer in the engine room of mine No. 18 of the Byproducts Coal Co., near Benton, in Franklin County, caused a fire which damaged the surface plant to the extent of $150,000. The mine has been idle about ten days, but work will be resumed shortly, as equipment has been received and a large force of workmen are now engaged in installing the new machinery and repairing the buildings.

According to an announcement by General Manager Barbour, arrangements have been made for financing the extension of the Marion & Eastern R. R., which runs from Marion, in Williamson County, to Fulton, in Saline County, and from the latter place to Carrier Mills in the same county. This road traverses one of the richest coal fields in Southen Illinois.

INDIANAPOLIS

Without Priority Order for Coal, Utilities Must Close—Acute Car Shortage—Coal Sold at Contract Prices—Preferential Distribution of Cars Asked.

Public service corporations from all over Indiana are besieging the Public Service Commission for assistance in securing a priority order for coal. They declare that unless something is done quickly, scores of gas, water and electric utilities will be forced to close.

John W. McCardle, vice chairman of the Public Service Commission, is directing the fuel investigation at the request of the Interstate Commerce Commission and recently appealed to that body to re-establish the wartime priority orders at once.

Recently the car shortage at the mines was 60 per cent, whereas the greatest car shortage at any previous time in the history of Indiana mining was only 38 per cent.

Operators much prefer to sell contract coal at the agreed prices, if cars can be obtained, and deplore the soaring of "free coal" prices resulting from competition.

The American Coal Mining Co. has asked various state public organizations to see that concerted action be taken to get preferential distribution of cars to the coal industry, stating that the mines of the country can produce all the coal required but for the restricting deficiency in transportation.

Canada

BRITISH COLUMBIA MINES' CHIEF

James McGregor Succeeds George Wilkinson, Resigned—Provincial Inspector Goes With Pacific Coast Coal Mines, Ltd.—Life Story of Mr. McGregor.

George Wilkinson, Chief Inspector of Mines for British Columbia since early in 1917, has resigned and the appointment to the vacancy of James McGregor, senior member of the Mine Inspectors' Staff of the Province, has been announced. His term of office has been marked by signal advances, especially in respect to the improvement of underground working conditions.

Mr. Wilkinson, who has accepted the position of general superintendent of the Pacific Coast Coal Mines, Ltd., succeeded Thomas Graham (now general superintendent of the Canadian Collieries, Ltd.), as chief inspector. At the time of his appointment he was the manager of the Reserve mine of the Canadian Western Fuel Co.

Mr. McGregor has been connected with the Department of Mines for 22 years. He is a native of British Columbia, his parents having come from Scotland in 1849; his father being one of a party of eight coal miners engaged by the Hudson's Bay Co. to open up coal mines at Prince Rupert, Vancouver Island.

The boy McGregor went to work in the Nanaimo mines. Ambitious to qualify himself technically for higher positions, he attended both day and night schools; later he received private tuition under C. C. McKenzie, then Superintendent of Education for British Columbia.

While overman at the South Field collieries of the New Vancouver Coal Co. in 1888, he qualified for a first-class mine manager's certificate. In the year 1894 Mr. McGregor represented Nanaimo in the Provincial Legislature.

Later he was appointed to the position of Inspector of Metalliferous and Coal Mines for the Kootenays, which position he held at the time of receiving his present well-earned preferment.

Association Activities

Northern West Virginia Coal Operators' Association

Severe condemnation of the assigned-car system represented the action taken by directors of the Northern West Virginia Coal Operators' Association at a meeting held in Fairmont during the second week of May. It was pointed out at the meeting that the assignment of cars has been used by the railroads to secure an undue supply of fuel, seriously curtailing the production of fuel for commercial purposes. Legal action will be resorted to by the association to secure relief from the present intolerable assigned-car evil if relief can be secured in no other way. Action of the scale committee of the Northern West Virginia operators in reaching a wage agreement at Baltimore in April was ratified by the directors of the association.

Elk River Coal Association

The Elk River Coal Association has perfected its organization by electing officers and establishing headquarters at Weston, W. Va. Although the membership of the association is confined to coal operators on Elk River and Dundon, yet Weston was selected as headquarters because it is also the headquarters of the Coal & Coke division of the Baltimore & Ohio R.R.

On the roster of officers are: C. L. Voglesang, of Clay, president; B. C. Barber, of Clay, vice-president; E. V. Shorr, secretary. The board of directors includes J. G. Bradley, Walter Wood and C. L. Voglesang. Mr. Shorr's appointment as secretary became effective on June 1, when he assumed charge of the offices of the association. He heretofore held an important position on the Kanawha & Michigan R.R.

Upper Potomac Mining Institute

The meeting of the Upper Potomac Mining Institute held early in May at Thomas, W. Va., largely attended by members, was featured by a paper prepared by William H. Noone, on the subject, "Timbering and the Prevention of Accidents."

The Upper Potomac institute has adopted the plan of having all papers read to the institute printed in pamphlet form, and distributed to members before the meeting at which they are to be read. The next following meeting of the institute was held at Piedmont, in the lower end of the Upper Potomac field, on May 29, when in addition to two papers read there was a musical entertainment.

Mine Foremen's and Fire Bosses' Institute

At the second meeting of the Mine Foremen's and Fire Bosses' Institute, held in Belington, a constitution was adopted and new members were admitted. A paper was read by Thomas Davis of Mabie, W. Va., on "Safety and the Mining Law"; this paper was well received by the members and was followed by an interesting discussion. The next meeting of the institute will be held at Junior, W. Va.

Smokeless Coal Operators' Association of West Virginia

In order to avoid the commandeering of coal by the Navy, as became necessary last year, the Smokeless Coal Operators' Association of West Virginia made arrangements in the course of a meeting at Washington, D. C., during the second week of May, to take care of the requirements of the Navy.

As the first step, a committee of members was selected to take this matter in charge and to work out a plan with Navy officials and with the coal operators of the various smokeless fields. The Navy tonnage may be obtained by allocating the amount of fuel to be supplied among the various smokeless companies.

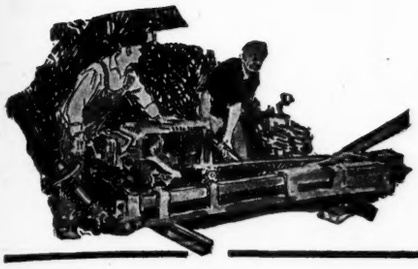
After studying pending legislation proposing further regulation of the coal industry, members of the association considered that it was useless to hope for any relief from shortage of production until the railroads secured the necessary equipment. A special committee of operators was selected to cooperate with the railroads in securing certain changes in the law.

Wholesale Coal Trade Association of New York

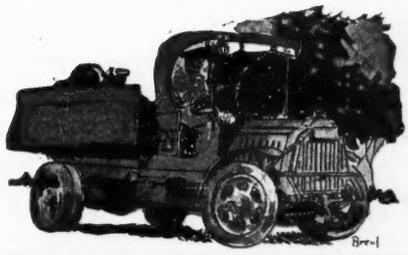
Shippers to the tidewater piers at New York are facing heavy demurrage charges owing to the strike of the marine and railroad workers, and the facts in the case will be presented to the Interstate Commerce Commission in an effort to effect a cancellation, or at least a suspension until an investigation can be made. The Wholesale Coal Trade Association of New York has called the attention of the Interstate Commerce Commission to the accrual of demurrage charges on tidewater shipments in the month of April, brought about by various strikes. The Interstate Commerce Commission has ruled that a strike is not an adequate reason for the cancellation of demurrage charges, yet conditions in this regard have materially changed since that ruling was made. The Wholesale Coal Trade Association states the facts surrounding the present situation are of so different a character and so widespread in their effect as to justify a modification of the commission's attitude. While the New York association makes this protest on behalf of shippers to the New York tidewater port, it is proposed to enlarge the scope of the application to cover the ports of Philadelphia, Baltimore and Hampton Roads if strikes have resulted in the accrual of demurrage charges at these ports.

Michigan-Ohio-Indiana Association

The program for the annual convention of the Michigan-Ohio-Indiana Coal Association, an organization of retailers of the three states, which will be held at Cedar Point, Ohio, June 16 to 18, inclusive, has been completed by Secretary B. F. Nigh, of the association. The attendance is expected to be about 1,200. Prominent among the topics to be discussed will be the car supply and costs of doing retail business. Homer C. Gill, of Columbus, president of the association, is preparing a lengthy statement of retail costs. Addresses will be made by Tom L. Lewis, formerly president of the United Mine Workers of America, now secretary of the New River Coal Operators' Association of West Virginia; H. G. Clabaugh, of the Peabody Coal Co., of Chicago, chairman of the Illinois Fair Price Commission; A. L. Allais, an executive of the Hazard Coal Operators' Association.



Mine and Company News



COLORADO

Craig—D. E. Evans, of this place, has completed preliminaries which will result in the opening of a coal mine at the southwest limits of Craig, in Moffat County, and cause the expenditure of a quarter million dollars to this district in the coming year. Mr. Evans obtained options on a total of 480 acres, for a coal company headed by George A. Levy, of Denver.

The company plans to sink a 500-ft. shaft on the property and begin development work at an early date in order to have the mine producing by the time the proposed Salt Lake & Denver R.R. is built to the west, thus giving an outlet for the coal.

IDAHO

Wallace—Three men were killed and one narrowly escaped death from gas in the Marsh mine near Burke, Idaho. The bodies of Fred L. Baron, superintendent of the mine; Charles Johnson and another miner yet unidentified were found beneath the water in the bottom of a shaft by a rescue crew.

ILLINOIS

Benton—It is said that the largest price given for coal land in Franklin County, Ill., was paid recently when the W. P. Rend Collieries Co., which operates a mine at Rend City in that county, purchased 600 acres, paying $75 per acre for same.

A big deal in coal lands is being negotiated between Bell & Zoller Mining Co., of Zeigler, and the W. P. Rend Coal & Coke Co., of Rend City. The deal involves ten sections of coal land in Franklin County, Ill., which the Rend company proposes to transfer to the Bell & Zoller Co. for nine sections in Williamson County, Ill.

Duquoin—A new mine is to be sunk near the old Lincoln operation, south of the town of Lincoln, which is expected to connect with the old workings of the mine, which has been closed down for years. The mine was abandoned after vain efforts had been made to smother a fire in the workings; later the tipple and other top works were torn down. It is intended that the new plant will enter the old mine's territory from another position and get the larger part of the coal which remains untouched. Lincoln (Ill.) men are backing up the scheme.

The united efforts of the various local unions around O'Fallon, northwest of here, have succeeded in purchasing the Taylor Opera House, which they will use for their meeting hall. The price paid for the structure amounted to $31,000.

The work at the Hallidayboro mine, five miles south of here, owned by the Jackson Coal Co., of Chicago, is progressing nicely and it is planned to hoist coal from the main shaft into the temporary tipple. This tipple is to be used during the time required to erect the big steel tipple which is now being shipped to the mine. The mine top works was recently totally destroyed by fire. The effect of this fire is especially felt in this district as the railroad, which uses much of the coal from this mine, finds it unusually hard to procure enough fuel to supply its many trains.

INDIANA

Evansville—A $150,000 plant will be erected by the Indiana Atomized Fuel Co. on its newly acquired property near the Crescent coal mine. The purchase of five acres of land near the mine has been completed. The company will manufacture a fuel product similar to powdered coal.

OHIO

Hocking—The Hocking Valley Mining Co., recently chartered at Columbus with a capital of $400,000, has started pumping out an abandoned mine on a 2,000-acre tract recently acquired by the company. It will require about six months to dewater the mine, after which a modern electrically-operated tipple will be constructed. It is expected that loading will start some time in September. The product will be sold through the Essex Coal Co., of Columbus.

Steubenville—Coroner T. H. Kirk of Jefferson County, who has been investigating the recent mine fire at Amsterdam in which 20 miners lost their lives, has rendered a decision that no one is guilty of negligence in the fire. He finds that the fire came from the fan room, and was caused by the explosion of a motor. In the inquiry the coroner called about 35 witnesses.

PENNSYLVANIA

Uniontown—The Hillman Coal & Coke Co. recently purchased a controlling interest in the Tower Hill Connellsville Coke Co. The Hillman interests now have 23 mines with an annual capacity of 6,000,000 tons.

Control in the company was formerly held by J. R. Nutt and associate capitalists of Cleveland. The company has approximately 1,500 acres of coal unmined and the two plants with 714 ovens are among the most modern in the region. L. W. Fogg, present general superintendent, who built the plants in 1907, will continue with the owners.

Connellsville — Connellsville and Uniontown men, organized as the Republic Coal & Coke Co., completed a deal with the Republic Iron & Steel Co., taking over the latter's plant at Atcheson, between Smithfield and Pt. Marion, in Fayette Co. The price is said to have been around $200,000, or about the same consideration the late John F. Atcheson, builder of the plant, received for it 22 years ago.

The officers of the new company are J. Fred Kurtz, president; Bruce F. Sterling, vice-president; W. D. McGinnis, treasurer, and Ross S. Matthews, secretary.

WEST VIRGINIA

Bluefield—Negotiations for the sale of the American Coal Co., operating in the Pocahontas field, were consummated during the first week of May, the sale price of the company being in excess of $3,000,000. The new owners of the American company are James A. McQuail, William McQuail, Edward J. Ennes, Wm. C. Atwater and others, of Bluefield, W. Va. The purchase of the American Coal Co. also covers 7,000 acres of coal land in the Pocahontas region. The American company operates at four different points, the mines so operated being known as the American, the Piedmont, the Crane Creek and the Pinnacle.

Morgantown—W. H. Warner & Co., of Cleveland, Ohio, operating mines in a number of bituminous regions, has entered the Marion County field, having acquired all the plants, acreage and assets of the Har-Mar Coal Co., the price paid, it is stated, being close to $500,000. The Har-Mar company owns Pittsburgh coal and a small acreage of Sewickley coal. The purchasers have already taken possession of the property.

VIRGINIA

Lynchburg—The Banner Fork Coal Corporation is understood to be planning general business expansion for increased operations. The company has increased its capital from $1,000,000 to $1,200,000.

CANADA

Fernie—A blowout in No. 1 East mine of the Coal Creek colliery of the Crow's Nest Pass Coal Co. occurred at noon May 14, forcing down 200 tons of coal and filling the mine with gas. All the workmen withdrew without injury.

Industrial News

New York, N. Y.—The Imperial Brass Manufacturing Co., with headquarters in Chicago, announces that on and after May 1, the New York office of the company will be located in the Longacre Bldg., 2nd St. and Broadway, New York City.

New York, N. Y.—Burns Brothers Coal Co.'s annual report for the year ended March 31, 1920, shows net profits after expenditures and Federal taxes of $1,027,055, equivalent to $11.44 a share on the $8,086,100 common stock outstanding, after allowances for dividends for the preferred issue. The Burns Brothers of New Jersey and the Burns Brothers of New York consolidated income account reported net sales of $24,053,980, against $21,286,870 in the year preceding.

New York, N. Y.—Goodin-Reid & Co., of this place, announces the reorganization of its Cincinnati branch under the direction of Charles W. Taylor with offices in the Pickering Building. A full line of Goodin-Reid bratticing materials will be carried in stock for prompt shipment to the local and Western trade. Under present freight conditions, this should be a special convenience to users of the company's products.

New York, N. Y. — The Worthington Pump & Machinery Corporation announces that it has completed preparations to furnish improved water-power machinery of all capacities, for low, medium and high-head service, including oil pressure system, water governors and other auxiliaries. The company has supplemented its staff with competent designers in hydraulic problems with experience gained in years of service in such lines.

Chicago, Ill.—The Webster Manufacturing Co., with executive offices here and works at Chicago and Tiffin, Ohio, makes the following announcement: Since the purchase of the Skillin and Richards Manufacturing Co., in June, 1918, a new building has been erected, which will increase the capacity of that plant about 50 per cent. The receiving and shipping facilities have been improved, and the plant made thoroughly up-to-date in all respects.

The sales offices formerly in the McCormick Building, and the general offices and engineering staff, at Tiffin, Ohio, now occupy the new office building, at 4500 to 4560 Cortland St., Chicago, Ill., to which office all correspondence should be addressed.

Personals

John L. Kemmerer was recently elected chairman of the board of directors of the West Virginia Coal & Coke Co.; Everett Drennen was made president.

D. Gleisen, manager of the Industrial Bearings division of the Hyatt Roller Bearing Co., has appointed W. F. Myer to be directing transmission engineer. In his new position Mr. Myer will be responsible for the sale of Hyatt line-shaft roller bearings; he has been doing field work with the Hyatt agents throughout the country for over two years.

C. P. Broadhead, wholesale anthracite and bituminous coal, announces removal to new offices at 29 Broadway—room 1020.

W. R. Davis, brother of T. B. Davis, president of the Island Creek Coal Co., and three other men were killed recently at mine No. 3 of the Mallory Coal Co., on Huff Creek, Logan County, W. Va., when a rock rolled down and crushed them. Five others were injured. They had taken shelter from a rainstorm in a mine opening.

Charles H. Chase, research expert of the Council of National Defense, regrets that he has been compelled to cancel his engagement to deliver an address before the Kentucky Mining Institute on June 4 and 5.

William H. Sterling, superintendent of the Docena mine of the Tennessee Coal, Iron & Railroad Co., between Pratt City and Adamsville, Ala., has been spending a few days in the Connellsville, Pa., coke region looking into matters connected with the mines and ovens of this field.

R. H. McGinley has been appointed manager of the Fairmont branch of the Tidewater Coal Co. Mr. McGinley was connected with the brokerage office of the company and prior to that was with the Antler and Robinson coal companies.

H. C. Drum, formerly manager of the Fairmont office of the Tidewater Coal Co., has completed arrangements for engaging in the coal brokerage and export business, having opened offices in the Hutchinson Building, at Fairmont, W. Va. Among other companies he will represent the William R. Seaman Co., of Baltimore, and the Wiley Beyes Fuel Co., of Uniontown, Pa.

M. H. Tomb, of Charleston, has been appointed district manager of the Raleigh Smokeless Fuel Co., his district comprising Norfolk & Western territory. Mr. Tomb's headquarters will be at Bluefield. For the last two years he has been the secretary of the Kanawha Coal Shippers' Association. The Raleigh Smokeless Fuel Company has offices at New York, Norfolk, Huntington and Beckley.

C. M. Roehrig, formerly secretary of the Northeast Kentucky Coal Association, with headquarters at Ashland, Ky., on June 1 severed his connection with that association to accept an important post with a company now in process of organization by New York capitalists. This company is negotiating for the purchase of mines in Kentucky and West Virginia. Mr. Roehrig's headquarters will be in Huntington, for the present in the office of the Tuttle Coal Co., a concern also having a sales office in Cincinnati.

Carl G. Barth, who was a pioneer in the machine building industry and to whom many other industries owe modern principles of production and management, has been elected an honorary member of the Taylor Society, with headquarters at 29 W. 39th St., New York, N. Y. Only two other men have been thus honored by this society, which is the national organization for the promotion of science in management; these men being Frederick W. Taylor, himself, and Henri Le Chatelier, the prominent engineer who developed scientific management in France.

Phillip Konrad has been appointed general manager of all the properties of J. C. Sullivan in southern West Virginia. Mr. Konrad will have under his direction mines in Raleigh, Wyoming and McDowell counties in addition to a large amount of development work. He will establish headquarters at Tralee, Wyoming County, W. Va. Mr. Konrad has been a civil and mining engineer in Fayette County, W. Va., for the last 20 years.

L. W. Sydnor, assistant to the president of the Lake & Export Corporation, of Huntington, W. Va., and Miss Eva Dietz of Charleston, W. Va., were united in marriage in that city on Saturday, May 1. They will live for the time being at Beckley, W. Va.

E. W. McCullough, for nine years executive secretary of the National Implement & Vehicle Association, with headquarters at Chicago, has been named manager of the new Industrial Production Department of the U. S. Chamber of Comerce. In the departmentalization plan of the National Chamber, the Industrial Production Department occupies an important place.

George F. Germain, proprietor of the Corning Mining Co., has sold his oil interests in the mining property and will devote his entire attention in the future to developing the mining end of the business.

L. H. Keim has been appointed general sales manager of the R. D. Nuttall Co., gear manufacturers, of Pittsburgh, Pa. Mr. Keim came with the company in 1911 as engineer in charge of erection work and the installation of equipment. Later he was assistant chief engineer, designing and developing heavy-duty railway and steel mill gearing. In 1916 he developed a standard tractor transmission unit and was soon placed in complete charge of this new field with headquarters in Chicago, Ill. From this work Mr. Keim has been brought back to the main office at Pittsburgh, to take charge of his present duties.

George M. Rowland, architect, has become associated with the engineering and surveying firm of Blum, Weldin & Co., of Pittsburgh, Pa. Mr. Rowland has practiced his profession for over 20 years, the last 12 of which he has been in the employ of a prominent architect of Pittsburgh, and has had responsible charge of the design and supervision of construction of some important buildings. Blum, Weldin & Co. has recently moved its offices to the seventh floor of the Bakewell Building, Pittsburgh.

George E. Long recently resigned as senior vice president of the Joseph Dixon Crucible Co. Shortly before his resignation, he celebrated his seventieth birthday. Mr. Long thereby terminates 43 years of active service with this company, beginning in the capacity of stenographer and advancing to the offices of secretary, treasurer and vice president, respectively. Mr. Long will continue as a director of the Dixon company. He was prominently connected with the growth of this company and was widely recognized as the "father" of graphite lubrication and of silica-graphite paint for protective purposes.

Recent Patents

Electrical Connector. George A. Mead, Mansfield, Ohio, assignor to Ohio Brass Co., Mansfield, Ohio, 1,336,475. April 13, 1920. Filed Jan. 5, 1918. Serial No. 210,523.

Pipe Wrench. Wasyl Zadorozny, Meacham, Sask., Can., assignor of one-half to Tony Zygiel, Hamilton, Can., 1,336,710. April 13, 1920. Filed March 13, 1919. Serial No. 282,465.

Rail Bond. William C. Starkey, Mansfield, Ohio, assignor to Ohio Brass Co., (a corporation of New Jersey), Mansfield, Ohio, 1,336,932. April 13, 1920. Original application filed June 26, 1916. Serial No. 105,943. Divided and this application filed Sept. 21, 1917. Serial No. 192,456.

Motor Control System. Eugene R. Carichoff, Schenectady, N. Y., assignor to General Electric Co. (a corporation of New York), Schenectady, N. Y., 1,337,040. April 13, 1920. Filed May 6, 1918. Serial No. 232,726.

Mechanism for Operating Reels of Mine Locomotives. Frank B. Deans, Sharon Hill, and Benjamin K. Kirk, Philadelphia, Pa., assignors to the Baldwin Locomotive Works (a corporation of Pennsylvania), Philadelphia, Pa., 1,337,048. April 13, 1920. Filed Dec. 5, 1917. Serial No. 205,572.

Grease Cup. Leon N. Bourdeau, Rock Island, Ill., assignor of one-half to John G. Sorenson, Davenport, Iowa, 1,337,432. April 20, 1920. Filed Feb. 7, 1919. Serial No. 275,484.

Process for Treating Coal. John N. Wingett, Denver, Col., assignor to Warren A. Haggott, trustee, Denver, Col., 1,337,496. April 20, 1920. Filed May 2, 1915. Serial No. 25,636.

Coming Meetings

Mine Inspectors' Institute of America will hold its annual meeting July 13, 14 and 15 at Cleveland, Ohio. Secretary, J. W. Paul, Pittsburgh, Pa.

Pennsylvania Retail Coal Merchants Association will hold its annual meeting June 23, 24 and 25 at Reading, Pa. Secretary, W. M. Bertolet, Reading, Pa.

The Rocky Mountain Coal Mining Institute will hold its annual meeting in Denver, Col., in conjunction with the National First Aid Meet on Aug. 20 and 21. Secretary, F. W. Whiteside, Denver, Col.

M. O. I. Coal Association will hold its annual convention June 16, 17 and 18 at Cedar Point, Ohio. Secretary, B. F. Nigh, Columbus, Ohio.

National Retail Coal Merchants' Association will hold its annual meeting June 10-12, Detroit, Mich. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

American Institute of Mining & Metallurgical Engineers will hold its fall meeting about Aug. 20. It is proposed to leave Buffalo by steamer and cruise through the Lakes, the first stop being at Houghton, Mich., after which the party will visit Duluth and the Iron Ranges of Minnesota, spending a day or two in Minneapolis on its return. Secretary, Bradley Stoughton, 29 West 39th St., New York City.

American Institute of Electrical Engineers holds annual convention at White Sulphur Springs, W. Va., June 29 to July 2. Secretary, F. L. Hutchinson, New York, N. Y.

The Colorado Retail Coal Dealers' Association will hold its annual meeting June 8, at Colorado Springs, Col. Secretary, E. Hopper, Denver, Col.

Illinois and Wisconsin Retail Coal Dealers' Association's annual meeting Aug. 4 and 5 at Milwaukee, Wis. Secretary, I. L. Runyan, Chicago, Ill.

Indiana State First Aid Meet at Clinton, Ind., July 5, under the auspices of the Indiana State First Aid Association, with the co-operation of the Clinton First Aid Association, Chamber of Commerce, Indiana Coal Operators' Association, United Mine Workers of America, Bureau of Mines, and State Mine Inspection Department.